



MUNICIPAL COUNCIL OF JOHANNESBURG.

**REPORT of the MEDICAL OFFICER OF
HEALTH on the PUBLIC HEALTH and
SANITARY CIRCUMSTANCES of
JOHANNESBURG during the Trien-
nium 1st July, 1906—30th June, 1909.**

TO WHICH IS APPENDED

**A REPORT by the MEDICAL ATTENDANT (Dr. P. G. STOCK)
on the HEALTH of the NATIVES and INDIANS employed
by the Council.**

CHARLES PORTER, M.D., D.P.H., *Barrister at-Law,*
Medical Officer of Health and Hon. Medical Officer to the Rand Water Board
and Rand Central School Board.

JOHANNESBURG,

28th February, 1910.

E. H. ADLINGTON & CO., JOHANNESBURG.

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SUMMARY OF STATISTICS

M.O.H. 1906-9

FOR THE

MUNICIPALITY OF JOHANNESBURG.

Latitude.—26 degrees 11 minntes 44 seconds South.

Longitude.—1 hour 52 minntes 10 seconds East.

Area.—The Area of the Mnnicipality of Johannesburg is 52,330 acres (*vide Government Gazette*, October, 1903).

Altitude.—The population of Johannesburg resides at a mean elevation of 5,850 feet.

Houses.—At the census in April, 1904, there were within this area 20,419 inhabited honses, containing an average of about 7·9 persons to a house.

Between Censns Day 1904, and 30th June, 1909, the number of houses erected within the Municipality was 5,636.

Annual Rateable Value.—The annual rateable value of property within the Mnnicipality of Johannesburg as assessed in accordance with Ordinance 43 of 1903, and representing “the full and fair price or sum which the same would realise if brought at the time of valnation to voluntary sale,” was as follows :—

1907	...	...	...	£36,201,530
1908	...	...	...	£36,390,666
1909	...	...	...	£36,566,336

The Town Council can impose a rate not exceeding 3d. in the £. The rate for 1907 was 2d., for 1908 2¾d., and for 1909 2d.

Years 1906-7—1907-8—1908-9.

YEAR.	WHITES.	COLOURED S.A.	ASIATICS.	TOTAL PERSONS.			
1906-7 (Estimated) ..	95,126	78,781	6,780	180,687			
1907-8 (Census) ...							
1908-9 (Estimated) ...							
					1906-7.	1907-8.	1908-9.
MARRIAGES (white)	1,179	1,191	1,155
PERSONS MARRIED (white)	2,358	2,382	2,310
MARRIAGE RATE per 1,000 Population (white)	24·7	25·04	24·28
BIRTHS (white)	3,431	3,484	3,610
BIRTH RATE per 1,000 Population (white)	36·0	36·6	37·9
DEATHS.		White.	Col. S.A.	Asiatics.			
1906-7	1,338	2,257	166	3,761	—	—
1907-8	1,322	2,314	164	—	3,800	—
1908-9	1,439	2,470	100	—	—	4,009
DEATH RATES.		Crude.		Col. S.A.	Asiatics.	All Persons.	
In 1906-7	14·0		28·6	24·4	20·8	
1907-8	13·8		29·3	24·1	21·0	
1908 9	15·1		31·3	14·7	22·1	

M.O.H. 1906-9

Introductory. To HIS WORSHIP THE MAYOR OF JOHANNESBURG (H. GRAUMANN, Esq.)

MR. MAYOR,—The preparation of my Report on the year 1906-7 was deferred from month to month in the hope of obtaining, by a special census enumeration, that reliable population-figure without which vital and mortal statistics are comparatively valueless. This figure was not, however, available till August, 1908. It subsequently became necessary for the writer to take 6 months leave, during which period, and for some months afterwards, the pressure of other work was so continuous that further postponement was inevitable. Thus it comes about that the Report which I have the honour to submit herewith covers the three years from 1st July, 1906, to 30th June, 1909, a period, however, which affords a more useful basis for statistical deductions than a comparatively short one of 12 months.

The GENERAL ARRANGEMENT OF THIS REPORT is similar to that adopted on previous occasions.

The CHIEF FACTORS OF MORTALITY are indicated at page 8. It is satisfactory to record that as compared with the three years 1903-6, deaths amongst *Whites* from PNEUMONIA were less by 20 per cent., from "DIARRHOEAL DISEASES" by 30 per cent, whilst as regards "ENTERIC" the cases notified fell 42 per cent., viz., 2,080 to 1,204, the deaths being 101 as against 256, a very notable improvement of 57 per cent. On the other hand, there was a very severe and widespread prevalence of SCARLET FEVER which caused 105 deaths as against 11 only in the three preceding years. Deaths from MEASLES, WHOOPING COUGH and CANCER were also more numerous, and mortality from HEART DISEASE was greater by 46 per cent. INFANTILE MORTALITY, *i.e.*, deaths of infants under 1 year of age, decreased from 171 to 132 per 1,000 births, a remarkable and encouraging reduction, as this rate is generally regarded as a "valuable test of the health of communities" (v. p. 8B).

Amongst *S.A. Coloured Persons*, PNEUMONIA, MENINGITIS, MINERS' PHTHISIS, WHOOPING COUGH and MEASLES all caused an increased mortality, while the number of deaths from TUBERCULOSIS was 42 per cent. higher. From DIARRHOEAL DISEASE, however, the death-roll was shorter by nearly 40 per cent., and there was only 1 fatal case of SMALLPOX.

As regards *Asiatics*, there was a decreased PNEUMONIA fatality and a large increase of deaths from "ACCIDENT" and "SUICIDE OR MURDER," chiefly amongst Chinese mine-coolies.

TWO VERY REMARKABLE OUTBREAKS OF ENTERIC, viz., in December, 1907, and March, 1909, each of which is believed to have been caused by an apparently healthy "TYPHOID-CARRIER," are recorded at pp. 12-16.

At pp. 20 and 21 are set out the results of inquiry as regards the source of infection, effect of occupation and duration of illness of fatal cases of TUBERCULOSIS AMONGST WHITES during 1907-9; and on pp. 24-5 the question of SYPHILIS AMONGST NATIVES is considered.

The question of MINERS' WORM or HOOKWORM (*Ankylostomiasis*) is discussed at p. 30 *et seq.*, especially in regard to the causes of the comparative immunity of the Transvaal mines.

The parasitic disease known as BILHARZIA, which Dr. George A. Turner has shewn to be so injuriously prevalent amongst mine labourers from the East Coast, especially in its relation to pneumonia and tuberculosis, is described at p. 32.

The SUPERVISION OF FOOD SUPPLIES is again dealt with in some detail at pp. 38-43; and the rather colourless findings of the Royal Commission of 1908 on the ADULTERATION OF POTABLE SPIRITS have been summarized for the enlightenment of those persons who suggest that it is within the Council's power to stop the sale of inferior spirits, apart from the question of dilution.

At p. 57 are indicated certain IMPORTANT MATTERS WHICH CALL FOR EARLY ATTENTION, viz., the ENDING OR MENDING OF THE MALAY LOCATION, the EXTENSION OF THE WATER-CARRIAGE SYSTEM OF SEWAGE DISPOSAL, and the BETTER CONTROL OF THE MILK SUPPLY.

I have much pleasure in again recording my high appreciation of Dr. P. G. Stock's invaluable services as Asst. M.O.H., and my particular indebtedness to him for his able direction of the Department while Acting M.O.H. from November, 1908—June, 1909, a period of considerable stress. The very excellent work of the Manager Scavenging Branch (Mr. Gavin, M.R.C.V.S.) and the Municipal Veterinary Surgeon (Mr. J. I. Smith, M.R.C.V.S.) is elsewhere referred to (v. pp. 50 and 53). I also owe much to the willing assistance of the competent general staff with which you have provided me; and I beg to express respectfully the hope that the Council may see fit, now that times are so much better, to re-instate these officials in the pecuniary position which they occupied previous to the retrenchments of October, 1907.

I have finally to acknowledge the prompt and kindly co-operation of my colleagues, the other heads and sub-heads of Departments, and the support which I have at all times received from the Council.

I have the honour to be, Mr. Mayor,

Your obedient Servant,

CHARLES PORTER,

Medical Officer of Health.

28th February, 1910.



REPORT

OF

MEDICAL OFFICER OF HEALTH

For Period from 1st July, 1906, to 30th June, 1909.

VITAL AND MORTAL STATISTICS.

CENSUS POPULATION.—The appended particulars are from the Census Enumeration of 17th April, 1904, and other official sources :—

RACE DISTINCTIONS (*Census, 1904*).

—	Males.	Females.	Persons.	Males.	Females.	Persons.
I. Europeans or Whites ...	—	—	—	51,629	31,734	83,363
II. All Coloured Races :—						
1. Aboriginal Natives, including Basutos, Bechuanas, Kaffirs, Zulus, etc. ...	55,765	3,840	59,605			
2. All other Coloured persons, including Hottentots, and other S. African coloured persons; also Malay, Chinese, Indians, and foreigners of coloured race ...	8,899	3,775	12,674	64,664	7,615	72,279
TOTALS ...	—	—	—	116,293	39,349	155,642

In view, however, of the difficulties experienced in forming a correct estimate of the number of people living in Johannesburg, a further Census was taken on the night of the 29th to 30th August, 1908, from which the appended particulars are obtained :—

RESULTS OF CENSUS OF JOHANNESBURG MUNICIPALITY ON NIGHT BETWEEN SATURDAY AND SUNDAY, 29TH-30TH AUGUST, 1908.

ADULTS.						CHILDREN.			
Number of Whites.		Number of South African Born Coloured.		Number of Asiatics.		Number of White Children between 7 & 14 inclusive.		Total Number of Whites under 16.	
Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
39,769	26,626	66,195	3,945	5,484	436	6,049	5,928	14,562	14,169

M.O.H. 1906-9	TOTAL WHITE POPULATION ...	...	...	...	95,126
Statistics.	TOTAL SOUTH AFRICAN-BORN COLOURED—				
	Adults in Johannesburg ...	...	70,140	}	78,781
	Children under 16 in Johannesburg ...	...	6,404		
	At Klipspruit Native Location ...	...	2,237		
	TOTAL ASIATICS—				
	Adults ...	...	5,920	}	6,780
	Children under 16 ...	...	860		
					180,687

NOTE.—The number of “SOUTH AFRICAN-BORN COLOURED CHILDREN” and of “ASIATIC CHILDREN” were not actually enumerated, but have been calculated as respectively 9·13 per cent. and 22·85 per cent. of the total number of these races (excluding Chinese mine coolies); these were the recorded percentages of coloured children at the 1904 Census.

The Census was taken under the direction of your M.O.H. by Mr. E. W. Hanscombe, whose figures were afterwards checked and certified by Mr. J. H. L. Manisty, Public Auditor.

The work involved was considerable, and special Bye-Laws had to be drawn up and approved by the Government before the actual enumeration could be made.

DENSITY OF POPULATION.

At the Census in 1904 there were about 21 persons per acre within the area actually used for building purposes, as against 60 in London and 12 in Capetown. It varied from 0·76 in Observatory to 89 and 148 in parts of Marshalls and Ferreiras respectively (v. Census p. lxxvi). Similar figures are not available in 1908 Census.

ESTIMATED POPULATION.

The difficulty of arriving at a correct population-estimate for Johannesburg is very great, for in such a community the effects of “bad times” and of market-depression are believed to be such that a population-figure, calculated by the arithmetical methods of more settled countries, would be very unreliable.

All things considered, however, it is thought that the 1908 Census may fairly be taken as representing the population of the other two years.

MARRIAGES.

From 1st July, 1906, to 30th June, 1909, the number of white marriages registered was 3,525, equal to a marriage rate of 24·7 per 1,000. The rate per 1,000 in “London” was 17·1 in 1906, 17·0 in 1907, and 15·9 in 1908.*

During the same period 462 coloured marriages were registered.

BIRTHS.

From 1st July, 1906, to 30th June, 1909, the number of white births registered was 10,525.

The birth-rate was high, being equal to 36·8 per 1,000. For “The 76 Great Towns” of England and Wales, in 1906 the birth-rate was 27·8, 1907, 27·0, and 1908, 26·9.*

During the same period 1,929 coloured births were registered, but as adult coloured females number only 3,945 against 66,195 adult coloured males, it would merely mislead to strike a birth-rate.

Illegitimate Births.—These numbered 111, 114 and 106 for the years 1906-7, 1907-8 and 1908-9 respectively, and during this period constituted 3·14 per cent. of all births as against 4·0 in England and Wales in 1906, and 3·7 in London in 1907. Whether this is the result of a higher morality or of other causes is matter for speculation.

A word may be said as to the influence of birth-rate upon death-rate. In large towns, “high death-rates go with high birth-rates. High death-rates, however, are not the result of “high birth-rates—they are more generally caused by bad sanitary conditions. Populations “having a continuously high birth-rate should (sanitary conditions being equal) have lower “death-rates than populations having low birth-rates; for if, year by year, the births exceed the “deaths amongst a population, not only are additional children under 5 years of age, whose “mortality is high, added to the population, but a still larger increase of those between 10 and “40, whose mortality is low, takes place, and counterbalances the other; whilst the proportion “of old people over 55 to the total population is diminished. Conversely, a continuously low “birth-rate means a small proportion of young adults, and a large proportion of old people, and “is therefore unfavourable to a low death-rate.”—(*Newsholme.*)

*Vide Registrar-General's Annual Summary, 1906-7-8.

DEATHS.

M.O.H. 1906-9

The deaths herein referred to are those of persons who died within the extended Municipal Area as defined by Proclamations 13 of 1902 and 46 of 1903. Statistics.

Race.	Deaths.		Death-Rate per 1,000.	
	Total.	Of Non-Residents.	Gross Recorded.	Excluding Non-Residents.
1906 to 1907.				
Whites ...	1,338	99	14.0	13.0
S. A. Coloured ...	2,257	111	28.6	27.2
Asiatics ...	166	7	24.4	23.4
All Persons ...	3,761	217	24.8	19.6
1907 to 1908.				
Whites ..	1,322	120	13.8	12.6
S. A. Coloured ...	2,314	106	29.3	28.0
Asiatics ..	164	2	24.1	23.8
All Persons ...	3,800	228	21.0	19.7
1908 to 1909.				
Whites ...	1,439	92	15.1	14.1
S. A. Coloured ..	2,470	154	31.3	29.5
Asiatics .	100	2	14.7	14.4
All Persons ..	4,009	248	22.1	20.8

In order to neutralize the errors in comparison of death-rates arising from variations in sex and age constitution of the population of different towns, the Registrar-General of England and Wales has calculated a series of 'factors' by which the recorded death-rates of the "Great Towns" can be multiplied, so as to make them correctly comparable. Dr. George Turner, Census Commissioner, 1904, very kindly worked out similar 'factors for correction' for the white population of Johannesburg. They were as follows: For Males, 1.4742489; Females, 1.2334079; Persons, 1.3912409, calculated on the average English death-rates for 1881-91.

The question of applying these factors to the death-rates now calculated on the Census Returns of 1908, has been carefully considered; but the sex-constitution of the population is not the same as in 1904, and there is no recent information as to age-distribution. Correction for age and sex has, therefore, not been made.

INFANTILE MORTALITY (*i.e.*, deaths of infants under 1 year per each 1,000 births registered :—

In 1906-7 : For Whites, 140 ; For Coloured, including Asiatics, 340.
 In 1907-8 : " " 121 ; " " " " 323.
 In 1908-9 : " " 134 ; " " " " 333.

DEATH-RATE IN BRITISH, COLONIAL AND FOREIGN CITIES.—Appended, for purposes of comparison, are particulars as to the "Death-Rate per 1,000 from All Causes" in large cities in other parts of the world :—

	1906.	1907.	1908.		1906.	1907.	1908.
Greater London (<i>i.e.</i> , Metropolitan and City Police Districts) ...	15.1	14.6	13.8	Paris ...	17.5	18.5	17.5
" 76 Great Towns " of England and Wales ...	15.9	15.4	15.8	Berlin ...	15.8	15.4	15.4
Edinburgh ...	16.0	16.0	15.2	Trieste ...	25.7	26.3	24.2
Glasgow ...	17.8	18.5	17.7	Vienna ...	17.5	17.3	17.6
Dublin ...	24.1	24.7	23.0	Rome ...	18.7	18.2	18.5
Calcutta (including plague deaths) ...	31.7	37.6	27.8	St. Petersburg ...	25.5	24.7	28.6
Bombay (including plague deaths) ...	54.4	39.6	39.1	Moscow ...	25.8	27.5	28.0
Madras ...	43.8	40.5	40.6	Cairo ...	36.1	38.4	38.8
Sidney ...	10.7	11.5	10.3	Alexandria ...	33.1	36.5	30.0
Brisbane ...	10.0	12.2	10.2	Durban ...	10.9	9.0	9.7
				Cape Town ...	11.1	10.6	12.9
				New York ...	18.3	18.5	16.5
				New Orleans ...	20.0	22.4	20.3
				Buenos Ayres ...	17.1	16.9	15.8

Except in regard to Durban and Cape Town, these figures are taken from the Annual Summary of the Registrar General for England and Wales, 1906-7-8.

M.O.H. 1906-9

CAUSES OF DEATH.

Mortality.

The causes of, and ages at death, and the local distribution appear separately for 1906-7 1907-8 and 1908-9, in the inset Tables A to J for "Whites," "Coloured South Africans" and "Asiatics" respectively.

The extent to which each of the principal causes of death contributed to the death-roll of the years 1906-7, 1907-8 and 1908-9, may be readily seen from the following table :—

DISEASE.	WHITES.			S.A. COLOURED.			ASIATICS.		
	1906 7.	1907-8.	1908-9.	1906-7.	1907 8.	1908-9.	1906-7.	1907-8.	1908-9.
Smallpox ...	—	—	—	—	1	—	—	—	—
Measles ...	5	23	33	5	15	29	—	—	2
Scarlet Fever ...	8	54	43	—	—	1	—	—	1
Epidemic Influenza ...	9	9	6	7	5	2	—	2	—
Whooping Cough ...	23	8	9	5	4	2	—	1	—
Diphtheritic Diseases	11	14	18	4	2	—	—	—	—
Enteric Fever ...	42	31	37	161	102	123	6	5	3
Diarrhoeal Diseases ...	215	145	212	253	139	154	11	8	6
Tuberculosis of Lung	88	81	84	322	303	383	16	12	12
All other Tuberculosis	9	17	8	24	62	35	1	1	—
Cancer ...	46	52	49	20	12	16	2	1	1
Premature Birth ...	75	68	76	30	31	30	4	5	6
*Developm'tal Diseases	142	141	110	53	49	50	4	7	4
Old Age ...	12	16	19	6	4	2	—	—	3
Meningitis ...	29	31	30	216	211	171	1	2	1
Organic Diseases of Heart ...	101	112	112	54	79	41	12	8	3
Pneumonia ...	113	119	129	527	740	763	6	13	10
Miners' Phthisis ...	31	33	29	10	16	20	—	—	—
Accident or Negligence	79	83	83	206	210	189	49	44	22
Suicide or Murder ...	32	31	33	27	27	33	28	18	7

The following observations are suggested by inspection of this Table :—

1. That during 1906-9 the Chief Factors of Mortality were :

- For Whites.—Diarrhoeal diseases (572 deaths, 90 per cent. among children under 5) : developmental diseases (393) : pneumonia (361) : heart disease (325) : tuberculosis (287) : accident (245) : cancer (146) : enteric (110) : scarlet fever (105) : suicide or murder (96) : miners' phthisis (93) : meningitis (90) : measles (61) : whooping cough (40) : and influenza (24).
- For S.A. Coloured.—Pneumonia (2,030) : tuberculosis (1,129) : accident (605) : meningitis (598) : diarrhoeal diseases (546) : enteric (386) : heart disease (174).
- For Asiatics.—Accident (115) : murder or suicide (53) : tuberculosis (42) : diarrhoeal diseases (25) : heart diseases (23) : and enteric (14).

In considering the figures for "Asiatics," it must be remembered that the Chinese mine coolies who were first employed within the Municipal area in December, 1904, have been steadily repatriated since June, 1907, and that the number employed at the end of June, 1909, did not exceed 1,490.

* These include congenital malformations, injuries and debility at birth, atelectasis oeternus neonatorum, atrophy, marasmus, dentition, rickets.

TABLE A.

RETURN OF DEATHS AMONG THE WHITE POPULATION FOR THE YEAR ENDING 30TH JUNE, 1907.

No.	CAUSES OF DEATH.	All Ages.	Under 1 year.	1—5 years.	5—15 years.	15—25 years.	25—65 years.	65 and upw'ds.	Number of District.													Hospi- tal.	Non- R'sd'nt	Un- known.	Total.
									I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.				
1	Small-pox - - -																								5
2	Measles - - -	5	1	3	1						1			1	1			1			1				8
3	Scarlet Fever - -	8	1	3	4							2			2						3				9
4	Epidemic Influenza -	9	3	2		1	2	1			1	3	1												23
5	Whooping Cough - -	23	13	9	1				1	1	3	3	1	3	5			2	2	1	2		1		6
6	Diphtheria - - -	6	1	4	1					1		1	1												5
7	Membranous Croup -	5	2	3										2		1				1	1				42
8	Enteric Fever - - -	42		2	3	12	25		10	6		4	2	1	2	1	3	2	1	2	3	1	4		
9	Cholera - - -																								
10	Plague - - -																								
11	Diarrhoea and Dysentery -	209	158	35	2	4	10		9	26	10	30	22	15	18	12	22	9	3	10	16		7		209
12	Epidemic Zymotic Enteritis -																								6
13	Enteritis - - -	6		1			5		2				1	2	1										
14	Other Continued Fevers -																								4
15	Erysipelas - - -	4				1	3			1	1			1						1			1		4
16	Puerperal Fever - -	4					4							1							2				2
17	Other Septic Diseases -	2				1	1		1												1				8
18	Acute Rheumatism or Fever -	8		1	1	1	4	1	2	2							1		1	1	1				3
19	Intermittent Fever - -																								1
20	Malarial Cachexia - -	3				1	2		2	1															3
21	Tuberculosis of Meninges -	1		1								1													1
22	Tuberculosis of Lungs - -	88	3	3	1	7	72	2	12	3	6	12	1	7	9	3	2	4	2	2	9	1	15		88
23	Other forms of Tuberculosis -	8	4	2			2		2	1		1	2				1	1							8
24	Alcoholism - - -	7					7		4			2				1									7
25	Cancer - - -	46				1	37	8	7	3	3	5	3	3	5	1	1	2			5		8		46
26	Premature Birth - - -	75	75						6	10	4	10	13	2	8	4	4	1	1	1	9	1	1		75
27	Developmental Diseases - -	142	136	5	1				16	10	7	25	11	12	19	8	15	6	1	2	7	1			142
28	Old Age - - -	12					2	10	1	3	1		2		2	1	1								12
29	Meningitis - - -	29	9	7	3	4	6		2	2	3	2	3	5	1	1	1	2		1	2		4		29
30	Other Diseases of Nervous System -	29			1	4	15	9	2	3	2	3	2		3		3	1	1	1	1		7		29
31	Organic Diseases of Heart -	101	5	3	7	8	67	11	11	11	11	8	6	8	12	7	11	1	4		3	1	7		101
32	Acute Bronchitis - - -	37	29	4	2		1	1	3	1	4	8	3	6	2	1	1	3			5				37
33	Chronic Bronchitis - -	6					5	1			1		1	1	1		1			1					6
34	Pneumonia, Lobar or Croupous -	69	16	4	2	9	34	4	5	9	5	7	9	3	5		3	4	4		7		6		69
35	Pneumonia, Broncho or Catarrhal -	44	17	9	3	3	11	1	3	7		4	7	7	3	2	5	2							44
36	Rockdrill ditto, or Miners' Phthisis -	31					31		2		5	4	2	6				2	3	4	1		2		31
37	Diseases of Stomach - -	11				1	10		2		1	2	1		1	2				1	1				11
38	Obstruction of Intestines -	16	3			2	11		1	5	1	1		1	1				1		3		2		16
39	Cirrhosis of Liver - -	10			1		8	1		2				3				2	1		1		1		10
40	Nephritis or Bright's Disease -	35		1	2	1	26	5	7	2	9	2	1	3	1	1	3			3	2				35
41	Scurvy - - -																						3		5
42	Syphilis - - -	5	2				2		1					1											
43	Tumours, etc., Affections of Female Genital Organs - -	10				2	8		1		1	1			1	1					2		3		10
44	Diseases of Parturition - -	8				3	5				1	1	1		2	1				2					8
45	Accident or Negligence - -	79		9	1	6	53		3	5	3	9	2	3	10		4	12	5	6	9		7	1	79
46	Suicide or Murder - - -	32		1	1	2	28		4	4	3	4	1	5	2		1	1		3	1	1	2		32
47	All other causes - - -	73	4	1	6	11	46	5	12	6	8	4	5	2	7		1	3	1	1	5	3	13		73
TOTALS		1338	482	113	54	86	543	60	134	128	98	161	104	104	124	50	85	62	30	46	103	9	99	1	1338

DISTRICT No. 1 includes that portion of Johannesburg (farm Randjeslaagte), south of the Railway and north of Commissioner Street.
DISTRICT No. 2 includes Braamfontein, Hospital Hill and Hillbrow.
DISTRICT No. 3 includes Marshall's Town and City and Suburban.
DISTRICT No. 4 includes Ferreira's, Fordsburg and Mayfair.
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DISTRICT No. 6 includes Jeppes, Jeppes Extension, Belgravia, etc.
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DISTRICT No. 8 includes Berea, Yeoville, Bellevue, Bellevue East and North-Eastern suburban portion.
DISTRICT No. 9 includes Auckland Park, Richmond, Melville, Newlands, Claremont and North-Western suburban portion.
DISTRICT No. 10 includes Paarl's Hoop and Mines from Robinson Westwards to boundary.
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DISTRICT No. 12 includes Prospect Town, Denver and the Mines from Meyer and Charlton to Eastern boundary.
DISTRICT No. 13 includes Ophirton, Booyens, Turffontein, Rosettenville, etc. (Southern suburban portion).



TABLE B.

RETURN OF DEATHS AMONG THE WHITE POPULATION FOR THE YEAR ENDING 30TH JUNE, 1908.

No.	CAUSES OF DEATH.	All Ages.	Under 1 year.	1—5 years.	5—15 years.	15—25 years.	25—65 years.	65 and upw'ds.	Number of District.													Hospi- tal.	Non- R'sd'nt.	Un- known.	Total.
									I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.				
1	Small-pox - - -																								
2	Measles - - -	23	6	14	3				1		3	4	12	1		1	1								23
3	Scarlet Fever - -	54	5	30	16	1	2		2	4	6	10	6	1	16		2		1		5		1		54
4	Epidemic Influenza -	9	3	2			4				2	2		2			2					1			9
5	Whooping Cough - -	8	5	3									3	1	1		2	1					1		8
6	Diphtheria - - -	11	2	8	1							1	4		1	3					1		1		11
7	Membranous Croup -	3	1	2													1				1		1		3
8	Enteric Fever - - -	31		2		8	21		3	2	2	1	3	1	4	1	3	2	2	2	1		4		31
9	Cholera - - -																								
10	Plague - - -																								
11	Diarrhoea and Dysentery -	137	100	27	3		7		10	9	11	18	9	10	20	5	6	4	2	6	20		6	1	137
12	Epidemic Zymotic Enteritis																								
13	Enteritis - - -	8	1			1	5	1	1		1			1	1			2			1		1		8
14	Other continued fevers -																								
15	Erysipelas - - -	1						1							1										1
16	Puerperal Fever - -	11					6	5	2	1	2			2			1			1	1		1		11
17	Other Septic Diseases -	6	1				2	3	3												1		2		6
18	Acute Rheumatism or Fever	8			1	2	5		2	2	1								1		1		1		8
19	Intermittent Fever -																								
20	Malarial Cachexia - -	3						3												1	1		1		3
21	Tuberculosis of Meninges -	1		1											1										1
22	Tuberculosis of Lungs -	81	2	7	1	7	64		9	2	4	10	3	9	5	2	3	6	1	3	3	1	20		81
23	Other Forms of Tuberculosis	16	2	2	2	1	9		1	2		4	1				2		1	2			3		16
24	Alcoholism - - -	11					11		2		1	2	1		2						1		2		11
25	Cancer - - -	52			1	1	40	10	1	2	3	4	7	3	5	2	2	1	1	3	7		11		52
26	Premature Birth - - -	68	68						5	11	2	5	9	3	8	5	5	1	2	2	10				68
27	Developmental Diseases -	141	128	13					12	7	7	18	18	17	17	12	7	5		7	11		3		141
28	Old Age - - -	16						16	3	1		2	1	1	3	2					2		1		16
29	Meningitis - - -	31	13	9	5	1	3		1	2	3	4	1	4	3		2	1	2	3	5				31
30	Other Diseases of Nervous System	29			2	2	17	8	2	2	1		1	2	4	2	1	1	1		2		9	1	29
31	Organic Diseases of Heart -	112	13	1	4	9	76	19	11	21	8	8	4	8	14	3	6	7	1	1	10		10		112
32	Acute Bronchitis - -	20	15	3			2		2	1	1		6	2	1		3				4				20
33	Chronic Bronchitis - -	7		1			4	2	3		1	2							1						7
34	Pneumonia, Lobar or Cronpous	85	15	17	2	5	42	4	12	5	11	8	9	6	4	4	3	5	2	1	9		6		85
35	Pneumonia, Broncho or Catarrhal	34	27	6			1		4	5	1	2	7	6	3	1	2				3				34
36	Rockdrill ditto, or Miners' Phthisis	33					32	1	1			10		5	1	1	1	5	2	3	2		2		33
37	Diseases of Stomach - -	4					4			1				2							1				4
38	Obstruction of Intestines -	12	5			2	5		3	1	2		1		2		1			1	1				12
39	Cirrhosis of Liver - -	9					9		3			1		1	1						1		2		9
40	Nephritis or Bright's Disease	28	1	1	1	3	17	5	6	3	2	3		3	3		1		1		2		3		28
41	Scurvy - - -											1			2								1		7
42	Syphilis - - -	7	5				2				2	1			2				1						
43	Tumours, etc., Affections of Female Genital Organs - -	9					3	6		2	1			1	1	1					1		2		9
44	Diseases of Parturition - -	10					4	6		2	2	1			1	1	1				1		2		10
45	Accident or Negligence - -	83	2	17	7	6	49	2	6	5	4	2	5	9	8	2	4	9	5	12	5	1	5	1	83
46	Suicide or Murder - - -	31				4	27		10	1	2	2	1	2	7	1	1			1			3		31
47	All other causes - - -	79	2	4	5	8	53	7	10	5	5	9	1	3	10	3	5	4	2	2	3		15	2	79
TOTALS - - -		1,322	422	170	54	76	534	66	131	99	91	134	113	106	150	52	64	58	29	51	117	2	120	5	1,322

DISTRICT No. 1 includes that portion of Johannesburg (farm Randjeslaagte), south of the Railway and north of Commissioner Street.

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TABLE C.

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No.	CAUSES OF DEATH.	All Ages.	Under 1 year.	1—5 years.	5—15 years.	15—25 years.	25—65 years.	65 and upw'ds.	Number of District.													Hospi- tal.	Non- R'sd'nt	Un- known.	Total.
									I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.				
1	Small-pox - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Measles - - -	33	10	23	-	-	-	-	-	2	2	6	15	2	-	1	2	-	-	1	2	-	-	-	33
3	Scarlet Fever - - -	43	4	21	14	3	1	-	5	5	2	9	4	2	7	2	1	3	-	-	3	-	-	-	43
4	Epidemic Influenza - - -	6	1	-	1	-	3	1	-	-	2	1	-	3	1	-	-	-	1	-	-	-	-	-	6
5	Whooping Cough - - -	9	3	4	2	-	-	-	-	1	-	-	2	4	-	-	-	-	-	-	2	-	-	-	9
6	Diphtheria - - -	12	2	6	3	-	1	-	1	-	2	2	-	-	4	-	-	-	1	-	2	-	-	-	12
7	Membranous Croup - - -	6	2	4	-	-	-	-	-	-	-	2	3	-	-	1	1	-	-	-	-	-	-	-	6
8	Enteric Fever - - -	37	-	2	-	12	22	1	5	2	4	5	-	6	3	-	1	1	-	2	2	-	6	-	37
9	Cholera - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Plague - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Diarrhoea and Dysentery - - -	180	143	29	-	1	3	4	8	22	12	16	24	24	13	9	26	3	3	1	18	-	1	-	180
12	Epidemic Zymotic Enteritis - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Enteritis - - -	32	19	3	1	2	5	2	2	2	-	5	1	4	6	1	4	1	1	-	5	-	-	-	32
14	Other Continued Fevers - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Erysipelas - - -	3	2	-	-	-	1	-	2	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	3
16	Puerperal Fever - - -	8	-	-	-	-	8	-	1	-	-	2	-	2	2	-	-	-	-	-	-	-	1	-	8
17	Other Septic Diseases - - -	5	1	1	-	2	1	-	1	1	-	-	-	1	1	-	-	1	-	-	-	-	1	-	5
18	Acute Rheumatism or Fever - - -	4	-	-	-	-	3	1	-	1	-	-	-	1	1	-	-	-	-	-	-	-	1	-	4
19	Intermittent Fever - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	Malarial Cachexia - - -	8	-	1	-	1	6	-	2	-	1	-	-	-	1	1	-	-	2	1	-	-	-	-	8
21	Tuberculosis of Meninges - - -	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	1
22	Tuberculosis of Lungs - - -	84	-	1	2	3	77	1	5	5	5	9	4	6	7	2	2	6	4	4	5	2	18	-	84
23	Other forms of Tuberculosis - - -	7	-	-	1	-	5	1	-	1	1	1	-	1	-	1	-	-	2	-	-	-	-	-	7
24	Alcoholism - - -	10	-	-	-	-	10	-	3	-	1	2	-	-	-	-	-	1	-	-	2	-	1	-	10
25	Cancer - - -	49	-	3	-	1	34	11	6	8	2	4	1	5	7	4	-	1	-	2	5	-	4	-	49
26	Premature Birth - - -	76	76	-	-	-	-	-	9	14	5	6	10	5	10	1	5	-	1	2	7	1	-	-	76
27	Developmental Diseases - - -	110	105	5	-	-	-	-	10	9	10	8	10	13	13	6	10	6	1	4	9	1	-	-	110
28	Old Age - - -	19	-	-	-	-	1	18	1	3	1	1	2	1	3	2	1	-	-	2	-	-	2	-	19
29	Meningitis - - -	30	14	9	3	-	4	-	2	3	3	1	2	3	7	-	4	1	-	-	3	-	1	-	30
30	Other Diseases of Nervous System - - -	22	-	1	-	-	16	5	1	1	1	4	-	2	2	2	1	-	1	1	-	-	6	-	22
31	Organic Diseases of Heart - - -	112	7	3	11	6	71	14	11	10	13	7	10	9	8	3	5	3	6	2	8	1	16	-	112
32	Acute Bronchitis - - -	28	18	4	-	1	2	3	3	2	2	2	1	5	3	1	3	2	-	-	4	-	-	-	28
33	Chronic Bronchitis - - -	11	-	-	-	-	9	2	3	1	1	-	-	-	2	-	-	1	1	-	1	-	1	-	11
34	Pneumonia, Lobar or Croupous - - -	89	23	18	3	6	35	4	12	4	7	12	7	9	9	5	3	3	5	4	7	-	2	-	89
35	Pneumonia, Broncho or Catarrhal - - -	40	26	10	1	-	2	1	2	4	5	2	11	2	-	3	1	1	1	2	3	-	3	-	40
36	Rockdrill ditto, or Miners' Phthisis - - -	29	-	-	-	-	29	-	4	-	2	7	-	3	1	-	1	4	-	3	3	-	1	-	29
37	Diseases of Stomach - - -	8	-	-	-	-	6	2	-	1	-	1	-	1	1	-	-	-	-	-	2	-	2	-	8
38	Obstruction of Intestines - - -	10	2	-	-	1	7	-	-	2	-	-	1	-	1	-	-	1	-	-	3	-	2	-	10
39	Cirrhosis of Liver - - -	11	-	-	-	-	11	-	2	1	2	1	-	1	1	-	-	-	-	-	2	-	-	1	11
40	Nephritis or Bright's Disease - - -	34	-	1	3	3	26	1	8	3	4	3	1	3	3	-	4	1	-	2	-	-	2	-	34
41	Scurvy - - -	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
42	Syphilis - - -	6	3	-	-	1	2	-	-	1	2	-	1	-	-	-	-	-	1	-	-	-	1	-	6
43	Tumours, etc., Affections of Female Genital Organs - - -	4	-	-	-	-	4	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	1	-	4
44	Diseases of Parturition - - -	9	-	-	-	2	7	-	-	2	-	1	-	1	2	-	-	1	-	1	-	-	1	-	9
45	Accident or Negligence - - -	83	4	10	7	14	48	-	4	5	6	7	5	4	4	3	10	6	9	9	5	1	4	1	83
46	Suicide or Murder - - -	33	-	-	-	3	30	-	5	3	2	-	2	3	5	1	2	1	-	1	3	2	3	-	33
47	All other causes - - -	137	21	7	6	4	91	8	15	16	10	8	8	15	17	8	7	2	5	4	6	4	12	-	137
TOTALS - - -		1439	487	167	58	66	581	80	133	135	108	133	126	142	148	56	96	51	44	49	112	12	92	2	1439

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TABLE D.

RETURN OF DEATHS AMONG THE S.A. COLOURED POPULATION FOR THE YEAR ENDING 30TH JUNE, 1907.

No.	CAUSES OF DEATH.	All Ages.	Under 1 year.	1—5 years.	5—15 years.	15—25 years.	25—65 years.	65 and upw'ds.	Number of District.													Hospi- tal.	Non- R'sd'nt.	Un- known.	Total.
									I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.				
1	Small-pox - - -																								
2	Measles - - -	5				5												4	1						5
3	Scarlet Fever - -																								
4	Epidemic Influenza -	7				3	3	1										2		2	1				7
5	Whooping Cough - -	5	4	1									2		1										5
6	Diphtheria - - -	1		1									1	2				1							1
7	Membranous Croup -	3	2	1																					
8	Enteric Fever - - -	161		1	4	81	75		2	2	3	3	28		3		2	52	38	16	6		2	3	161
9	Cholera - - -																								
10	Plague - - -																								
11	Diarrhoea and Dysentery -	249	58	13	2	67	109				3	6	23	1	2		3	69	13	22	100		6	1	249
12	Epidemic Zymotic Enteritis -																								
13	Enteritis - - -	4	1			1	2								1			1		1	1				4
14	Other continued fevers -																								
15	Erysipelas - - -	1				1												1							1
16	Puerperal Fever - -	1					1												1						1
17	Other Septic Diseases -	2	1				1			1								1							2
18	Acute Rheumatism or Fever -	12			1	4	7											2	2	4	2		2		12
19	Intermittent Fever - -																								
20	Malarial Cachexia - -	24				9	15											4	7	9	3		1		24
21	Tuberculosis of Meninges -	1					1																		1
22	Tuberculosis of Lungs -	322	3	4	2	103	209	1	3	1	3	8	15		7	1		117	16	51	75	1	23	1	322
23	Other Forms of Tuberculosis -	23	3	2		4	14				1	2	2		1			7	1	1	7			1	23
24	Alcoholism - - -	2					2					1		1											2
25	Cancer - - -	20				6	13	1		1		1	3		1			4	2	2	2		4		20
26	Premature Birth - - -	30	30														2	1		1	7		1		30
27	Developmental Diseases -	53	49	4					2									5		2	9		7		53
28	Old Age - - -	6					2	4										1			1				6
29	Meningitis - - -	216	4	2	1	129	80		6		2	4	3		1		1	90	37	23	42		6	1	216
30	Other Diseases of Nervous System -	15	1			4	10						2					1	3	2	4		3		15
31	Organic Diseases of Heart -	54	1		3	8	42		3	2	2		6		4	1	1	9	8	5	7	1	5		54
32	Acute Bronchitis - -	44	22	17	1	1	3		1	1	3	4	5		2		2	9	1	1	13		2		44
33	Chronic Bronchitis - -	17				8	9					1	1	1				6	1	6	1				17
34	Pneumonia, Lobar or Croupous -	498	13	12	14	215	241	3	13	5	8	7	25	4	3	1	4	193	97	59	62	3	12	2	498
35	Pneumonia, Broncho or Catarrhal -	29	13	4		4	8				6	1	4		2			4	4	4	1	1	1	1	29
36	Rockdrill ditto, or Miners' Phthisis -	10					10												4	1	4				10
37	Diseases of Stomach - -	4	2				2						2							1					4
38	Obstruction of Intestines -	8				2	6					1	1					4			2				8
39	Cirrhosis of Liver - -	5					5											2	1		1		1		5
40	Nephritis or Bright's Disease -	12				3	9					1	1				1	3	2	3				1	12
41	Scurvy - - -	55				16	39		1	1	1	3						34	4	6	3		2		55
42	Syphilis - - -	25	4	1		7	11	2				1	1					2	5	1	2		13		25
43	Tumours, etc., Affections of Female Genital Organs - -																								
44	Diseases of Parturition - -	3				2	1				1									1			1		3
45	Accident or Negligence - -	206	2	1	4	82	117		5	4	4	1	7	2	3		2	71	32	53	11		8	3	206
46	Suicide or Murder - -	27	1			6	20		1		1		2		1	1		7	5	3	4		1	1	27
47	All other causes - -	97	5	1		31	59	1	2	1	3	3	5	2	2			29	7	19	16		5	3	97
TOTALS - - -		2,257	219	65	32	801	1,127	13	39	22	54	59	151	16	42	4	18	736	294	299	388	6	111	18	2,257

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TABLE E.

RETURN OF DEATHS AMONG THE S.A. COLOURED POPULATION FOR THE YEAR ENDING 30TH JUNE, 1908.

No.	CAUSES OF DEATH.	All Ages.	Under 1 year.	1—5 years.	5—15 years.	15—25 years.	25—65 years.	65 and upw'ds.	Number of District.													Hospi- tal.	Non- R'sd'nt.	Un- known.	Total.
									I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.				
1	Small-pox - - -	1				1														1				1	
2	Measles - - -	15	1	4		7	3								2					6	4			15	
3	Scarlet Fever - -											3													
4	Epidemic Influenza -	5	2	1			2					1			2					2				5	
5	Whooping Cough - -	4	3	1					1			1									2			4	
6	Diphtheria - - -	1				1														1				1	
7	Membranous Croup -	1	1																					1	
8	Enteric Fever - - -	102			2	64	36		1	1	1	3	11	1	2		2	41	17	12	9	1	1	102	
9	Cholera - - -																								
10	Plague - - -																								
11	Diarrhoea and Dysentery -	132	35	11	1	41	44		2	1	2	5	9	3	4		1	42	5	23	34		1	132	
12	Epidemic Zymotic Enteritis -																								
13	Enteritis - - -	7	1			1	5													2	5			7	
14	Other continued fevers -																								
15	Erysipelas - - -	2				1	1											1		1				2	
16	Puerperal Fever - -	1				1														1				1	
17	Other Septic Diseases -	7			1	1	5					1	1					2		2	1			7	
18	Acute Rheumatism or Fever -	9				3	6					1		1				2	1	4				9	
19	Intermittent Fever - -																								
20	Malarial Cachexia - -	12				4	8											3	6	3				12	
21	Tuberculosis of Meninges -	6		2			4											1		4	1			6	
22	Tuberculosis of Lungs - -	303		1	1	131	170		3	2	4	14	15	2	3	1	1	131	14	32	58		23	303	
23	Other Forms of Tuberculosis -	56		2		23	31					4	2	1	1		1	13	3	4	20		3	56	
24	Alcoholism - - -	3					3		1		1	1												3	
25	Cancer - - -	12				1	11						2				1	1		4	2		2	12	
26	Premature Birth - - -	31	31						1	2	1	2	2	1	3			3		5	9		2	31	
27	Developmental Diseases - -	49	44	5					1	2	3	4	7	1	5		2	6	2	6	8		2	49	
28	Old Age - - -	4						1											1		1		1	4	
29	Meningitis - - -	211	3	4		111	93		4	2	2				1			45	24	35	94		3	211	
30	Other Diseases of Nervous System -	11				4	7		1		1				1			3	2		3			11	
31	Organic Diseases of Heart -	79	4	3		26	42	4	2	6	2	3		2	3		2	11	2	14	13		10	79	
32	Acute Bronchitis - - -	31	17	9	1	1	3								1			8		2	11		1	31	
33	Chronic Bronchitis - -	14				3	10	1	1			1					1	5		3	2			14	
34	Pneumonia, Lobar or Croupous -	720	13	15	5	300	386	1	5	7	6	13	9	6	9	3	2	210	132	154	140		14	720	
35	Pneumonia, Broncho or Catarrhal -	20	11	4	1	1	3				1	3					1	3	2		5		1	20	
36	Rockdrill ditto, or Miners' Phthisis -	16					16											7	1	2	6			16	
37	Diseases of Stomach - -	1				1														1				1	
38	Obstruction of Intestines - -	11				3	8							1			1	2	4	2			1	11	
39	Cirrhosis of Liver - - -	13				2	11				1						1	3			3		3	13	
40	Nephritis or Bright's Disease -	24			1	9	14		2	1	2	1						10	5	2	1			24	
41	Scurvy - - -	21				7	14											10	3	2	3		3	21	
42	Syphilis - - -	38	7	1		6	24		3								2	3	6	1	2		21	38	
43	Tumours, etc., Affections of Female Genital Organs - -	1					1									1								1	
44	Diseases of Parturition - - -	2					2				1										1			2	
45	Accident or Negligence - -	210	2	5	4	80	118	1	2		4	1			3		2	74	39	60	11	1	9	210	
46	Suicide or Murder - - -	27				12	15		1	1								10	3	7	3		1	27	
47	All other causes - - -	101	4	2	2	36	55	2	3	2	4	4			5			29	4	23	18		4	101	
TOTALS - - -		2,314	179	70	19	882	1,154	10	34	29	43	63	10	19	46	5	20	679	276	421	470	2	106		2,314

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TABLE F.

RETURN OF DEATHS AMONG THE S.A. COLOURED POPULATION FOR THE YEAR ENDING 30TH JUNE, 1909.

No.	CAUSES OF DEATH.	All Ages.	Under 1 year.	1—5 years.	5—15 years.	15—25 years.	25—65 years.	65 and upw'ds	Number of District.													Hospi- tal.	Non- R'sd'nt	Un- known.	Total.
									I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.				
1	Small-pox - - -																								
2	Measles - - -	29	2	5		20	2		1				5	1				4		1	11	2	4		29
3	Scarlet Fever - -	1		1								1											1		1
4	Epidemic Influenza -	2	1			1													1				1		2
5	Whooping Cough - -	2	2									1									1				2
6	Diphtheria - - -																								
7	Membranous Croup -																								
8	Enteric Fever - - -	123			2	64	57		1	3	1	4	3		2			30	31	35	3		10		123
9	Cholera - - -																								
10	Plague - - -																								
11	Diarrhoea and Dysentery -	134	37	17	2	34	44		7	2	4	3	6		2	1	3	23	6	32	33		12		134
12	Epidemic Zymotic Enteritis -																								
13	Enteritis - - -	20	3			5	12							1	1			1		2	15				20
14	Other Continued Fevers -	2				1	1											1				1			2
15	Erysipelas - - -	6				1	5			1								1	1	3					6
16	Puerperal Fever - -	2					2						1										1		2
17	Other Septic Diseases -	8				3	5											3	3	2					8
18	Acute Rheumatism or Fever -	17			2	4	11					1	2		1			1	3	7	1		1		17
19	Intermittent Fever - -																								
20	Malarial Cachexia - -	11			1	2	8											3	1	6	1				11
21	Tuberculosis of Meninges -																								
22	Tuberculosis of Lungs -	383	2		5	127	249		3	4	5	16	7	1	3		3	140	31	37	103	5	25		383
23	Other forms of Tuberculosis -	35		1		11	23			1			1		1			6	2	3	19		2		35
24	Alcoholism - - -	1					1											1							1
25	Cancer - - -	16				3	13				1	4						2	1	1	3		4		16
26	Premature Birth - - -	30	30						2			3	6	1	3	1	1	2		2	9				30
27	Developmental Diseases -	50	47	3							6	5	9	3	6	1		3	1	4	9		3		50
28	Old Age - - -	2						2															2		2
29	Meningitis - - -	171	5	3	2	93	68			3	2	2	1		1			31	17	19	89	1	5		171
30	Other Diseases of Nervous System -	10				3	7			1								2	2	1	3		1		10
31	Organic Diseases of Heart -	41	2		2	11	25	1	1		2	3	3	1	1		1	9	3	8	4	2	3		41
32	Acute Bronchitis - -	19	11	2		1	4	1			1	1	3					4		1	7	1	1		19
33	Chronic Bronchitis - -	14	1		1	1	9	2										8	1	3	1		1		14
34	Pneumonia, Lobar or Croupous -	742	30	7	6	286	409	4	6	6	4	5	18	2	7	3	5	212	144	191	106	5	27	1	742
35	Pneumonia, Broncho or Catarrhal -	21	15	1		3	2		2	2	3		2				1			2	8	1			21
36	Rockdrill ditto, or Miners' Phthisis -	20				3	17											1	4	6	8	1			20
37	Diseases of Stomach - -	3				1	2						2					1							3
38	Obstruction of Intestines -	8	1		1	1	5		1			2			1			1	1	1			1		8
39	Cirrhosis of Liver - -	15				5	10				1							4	1	6	2		1		15
40	Nephritis or Bright's Disease -	34	2	1		11	19	1		1	2	1	3	2	4		1	6	3	5	3	1	2		34
41	Scurvy - - -	57				15	42					1						19	5	26	2		4		57
42	Syphilis - - -	38	6	4		5	22	1			1		2		1			2	1	1		3	27		38
43	Tumours, etc., Affections of Female Genital Organs -	1					1									1									1
44	Diseases of Parturition - -	1				1			1																1
45	Accident or Negligence - -	189	4	4	2	76	103		3		1	1	6	1	6	1	1	65	55	41	4		4		189
46	Suicide or Murder - -	33				9	24				1	1	1			1		12	7	9	1				33
47	All other causes - -	179	11	1	4	63	99	1	3	1	5	7	6	2	2	1	1	31	26	34	43	5	12		179
TOTALS		2470	212	50	30	864	1301	13	31	25	40	62	87	15	42	10	17	629	351	489	489	28	154	1	2470

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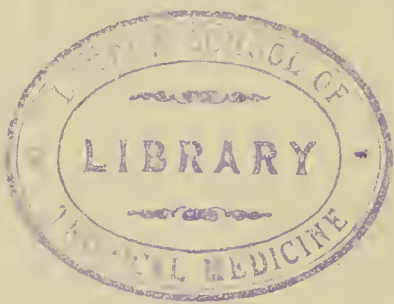


TABLE G.

RETURN OF DEATHS AMONG THE ASIATIC POPULATION FOR THE YEAR ENDING 30TH JUNE, 1907.

No.	CAUSES OF DEATH.	All Ages.	Under 1 year.	1—5 years.	5—15 years.	15—25 years.	25—65 years.	65 and upw'ds.	Number of District.													Hospi-tal.	Non-R'sd'nt.	Un-known.	Total.
									I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.				
1	Small-pox - - -																								
2	Measles - - -																								
3	Scarlet Fever - - -																								
4	Epidemic Influenza - - -																								
5	Whooping Cough - - -																								
6	Diphtheria - - -																								
7	Membranous Croup - - -																								
8	Enteric Fever - - -	6				6			2		1		1							2					6
9	Cholera - - -																								
10	Plague - - -																								
11	Diarrhoea and Dysentery - - -	11	3	5		2	1		2		1		5					1		2					11
12	Epidemic Zymotic Enteritis - - -																								
13	Enteritis - - -																								
14	Other continued fevers - - -																								
15	Erysipelas - - -	1					1													1					1
16	Puerperal Fever - - -	1				1											1								1
17	Other Septic Diseases - - -	1					1												1						1
18	Acute Rheumatism or Fever - - -																								
19	Intermittent Fever - - -																								
20	Malarial Cachexia - - -	2					2												1	1					2
21	Tuberculosis of Meninges - - -																								
22	Tuberculosis of Lungs - - -	16				7	9		1		2	1	6					1	1	2			2		16
23	Other Forms of Tuberculosis - - -	1					1											1							1
24	Alcoholism - - -																								
25	Cancer - - -	2					2						1					1							2
26	Premature Birth - - -	4	4										4												4
27	Developmental Diseases - - -	4	4						1				3												4
28	Old Age - - -																								
29	Meningitis - - -	1					1			1															1
30	Other Diseases of Nervous System - - -	1				1														1					1
31	Organic Diseases of Heart - - -	12	1			3	8		1	1	1		2		1			4		2					12
32	Acute Bronchitis - - -	4	3	1					1			1	2												4
33	Chronic Bronchitis - - -	1					1													1					1
34	Pneumonia, Lobar or Croupous - - -	4				1	3						1					1		2					4
35	Pneumonia, Broncho or Catarrhal - - -	2	1				1						1									1			2
36	Rockdrill ditto, or Miners' Phthisis - - -																								
37	Diseases of Stomach - - -																								
38	Obstruction of Intestines - - -	1					1						1												1
39	Cirrhosis of Liver - - -																								
40	Nephritis or Bright's Disease - - -	2					2						1					1							2
41	Scurvy - - -																								
42	Syphilis - - -	3				1	2												2	1					3
43	Tumours, etc., Affections of Female Genital Organs - - -																								
44	Diseases of Parturition - - -	1					1						1												1
45	Accident or Negligence - - -	49				14	35			1		1		1			1	4	12	26			2		49
46	Suicide or Murder - - -	28				4	24			1								9	4	13			1		28
47	All other causes - - -	8				2	6						1					3	2	1			1		8
TOTALS - - -		166	16	6		42	102		8	4	5	3	31		2		2	26	23	55			7		166

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TABLE H.

RETURN OF DEATHS AMONG THE ASIATIC POPULATION FOR THE YEAR ENDING 30TH JUNE, 1908

No.	CAUSES OF DEATH.	All Ages.	Under 1 year.	1—5 years.	5—15 years.	15—25 years.	25—65 years.	65 and upw'ds.	Number of District.													Hospi- tal.	Non- R'sd'nt	Un- known.	Total.
									I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.				
1	Small-pox - - -																								
2	Measles - - -																								
3	Scarlet Fever - - -																								
4	Epidemic Influenza - - -	2	2										1		1										2
5	Whooping Cough - - -	1	1																		1				1
6	Diphtheria - - -																								
7	Membranous Croup - - -																								
8	Enteric Fever - - -	5				2	3				1							1	1	2					5
9	Cholera - - -																								
10	Plague - - -																								
11	Diarrhoea and Dysentery - - -	8	3	1			2	2				2	2				2			2					8
12	Epidemic Zymotic Enteritis - - -																								
13	Enteritis - - -																								
14	Other Continued Fevers - - -																								
15	Erysipelas - - -																								
16	Puerperal Fever - - -																								
17	Other Septic Diseases - - -																								
18	Acute Rheumatism or Fever - - -	1				1																1			1
19	Intermittent Fever - - -																								
20	Malarial Cachexia - - -	1					1				1														1
21	Tuberculosis of Meninges - - -																								
22	Tuberculosis of Lungs - - -	12				3	9			1	2							1	2	6					12
23	Other forms of Tuberculosis - - -	1					1				1														1
24	Alcoholism - - -																								
25	Cancer - - -	1					1										1								1
26	Premature Birth - - -	5	5						1			1	1		1						1				5
27	Developmental Diseases - - -	7	7								1		4				2								7
28	Old Age - - -																								
29	Meningitis - - -	2		1		1							2												2
30	Other Diseases of Nervous System - - -	2					1	1					2												2
31	Organic Diseases of Heart - - -	8			1		7		2		1		3					1		1					8
32	Acute Bronchitis - - -	8	4	1	1		2		2				5				1								8
33	Chronic Bronchitis - - -	2					2				1				1										2
34	Pneumonia, Lobar or Croupous - - -	11	3		1	2	3	2				1	6				2	1	1	1			1		11
35	Pneumonia, Broncho or Catarrhal - - -	2	1	1							1	1													2
36	Rockdrill ditto, or Miners' Phthisis - - -																								
37	Diseases of Stomach - - -																								
38	Obstruction of Intestines - - -																								
39	Cirrhosis of Liver - - -																								
40	Nephritis or Bright's Disease - - -	3		1		1		1					3												3
41	Scurvy - - -																								
42	Syphilis - - -	2	1				1									1				1					2
43	Tumours, etc., Affections of Female Genital Organs - - -	1						1			1														1
44	Diseases of Parturition - - -	2					2			1		1													2
45	Accident or Negligence - - -	44		1	1	17	25			1			1					4	12	26					44
46	Suicide or Murder - - -	18	2			7	9			1			1		1			1	4	8		1			18
47	All other causes - - -	15	1		2	5	6	1	1	2	3		1				1	2	3	2					15
	TOTALS - - -	164	30	6	6	39	75	8	6	6	12	7	32		4	1	9	11	23	49	2		2		164

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TABLE J.
RETURN OF DEATHS AMONG THE ASIATIC POPULATION FOR THE YEAR ENDING 30TH JUNE, 1909.

No.	CAUSES OF DEATH.	All Ages.	Under 1 year.	1—5 years.	5—15 years.	15—25 years.	25—65 years.	65 and upw'ds.	Number of District.													Hospi- tal.	Non- R'sd'nt	Un- known.	Total.
									I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.				
1	Small-pox - - -																								
2	Measles - - -	2		2									2												2
3	Scarlet Fever - -	1		1									1												1
4	Epidemic Influenza -																								
5	Whooping Cough - -																								
6	Diphtheria - - -																								
7	Membranous Croup -																								
8	Enteric Fever - - -	3					3			1									2						3
9	Cholera - - -																								
10	Plague - - -																								
11	Diarrhoea and Dysentery -	4	1				3						3	1											4
12	Epidemic Zymotic Enteritis -																								
13	Enteritis - - -	2	1			1							1			1									2
14	Other Continued Fevers -																								
15	Erysipelas - - -																								
16	Puerperal Fever - - -																								
17	Other Septic Diseases - -	2					2					1							1						2
18	Acute Rheumatism or Fever -	1					1						1												1
19	Intermittent Fever - - -																								
20	Malarial Cachexia - - -																								
21	Tuberculosis of Meninges -																								
22	Tuberculosis of Lungs - -	12					12		1		2	2	4				1		1	1					12
23	Other forms of Tuberculosis -																								
24	Alcoholism - - -																								
25	Cancer - - -	1					1						1												1
26	Premature Birth - - -	6	6							1			4				1								6
27	Developmental Diseases - -	4	2	2									4												4
28	Old Age - - -	3						3					1								1				3
29	Meningitis - - -	1				1																	1		1
30	Other Diseases of Nervous System -																								
31	Organic Diseases of Heart -	3		1			1	1			1	1					1								3
32	Acute Bronchitis - - -	7	4	2				1	1			1	5												7
33	Chronic Bronchitis - - -																								
34	Pneumonia, Lobar or Croupous -	9	3	1	2	1	2		3				5						1						9
35	Pneumonia, Broncho or Catarrhal -	1	1										1												1
36	Rockdrill ditto, or Miners' Phthisis -																								
37	Diseases of Stomach - - -	2					2		1		1														2
38	Obstruction of Intestines - -																								
39	Cirrhosis of Liver - - -												1												
40	Nephritis or Bright's Disease -	1					1																		1
41	Scurvy - - -																								
42	Syphilis - - -																								
43	Tumours, etc., Affections of Female Genital Organs - - -																								
44	Diseases of Parturition - - -									1			1						16	4					22
45	Accident or Negligence - - -	22				8	14												4	2	1				7
46	Suicide or Murder - - -	7				2	5																		
47	All other causes - - -	6	1				4	1			1		2		1							1			6
	TOTALS - - -	100	19	9	2	13	51	6	6	3	5	5	37	1	1	1	3		24	9	2		2	1	100

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2. That the year 1907-8 appears to have been specially favoured as regards lessened incidence both of enteric fever and of diarrhoeal diseases (including dysentery), and in this respect stands about midway between the other two years. M.O.H. 1906-9 Mortality.

In the next table the Chief Factors of Mortality during the triennium under review are contrasted with those of the triennium ~~1906-9.~~ 1903-6.

		3 years, July 1903 to June, 1906.	3 years, July 1906 to June 1909.			3 years, July 1903 to June 1906.	3 years, July 1906 to June 1909.
Diarrhoeal Diseases	W.	817	572	Miners' Phthisis...	W.	119	93
	S.A.C.	908	546		S.A.C.	24	46
	A.	30	25		A.	—	—
Pneumonia ...	W.	450	361	Meningitis ..	W.	111	90
	S.A.C.	1,877	2,030		S.A.C.	416	598
	A.	79	29		A.	6	4
Developmental Diseases ...	W.	407	393	Measles.. ..	W.	45	61
	S.A.C.	170	152		S.A.C.	35	49
	A.	5	15		A.	1	2
Tuberculosis ...	W.	277	253	Epidemic Influenza	W.	43	24
	S.A.C.	795	1,008		S.A.C.	53	14
	A.	44	40		A.	2	2
Heart Disease ...	W.	269	325	Smallpox ..	W.	23	—
	S.A.C.	187	174		S.A.C.	14	1
	A.	26	23		A.	—	—
Enteric	W.	256	110	Whooping Cough	W.	21	40
	S.A.C.	323	386		S.A.C.	—	11
	A.	13	14		A.	—	1
Accident	W.	210	245	Scarlet Fever ...	W.	11	105
	S.A.C.	583	605		S.A.C.	1	1
	A.	50	115		A.	—	1
Cancer	W.	130	147	Suicide or Murder	W.	91	96
	S.A.C.	33	48		S.A.C.	43	87
	A.	7	4		A.	24	53

The total number of deaths in each of these 3-yearly periods was as follows :—

		1903-6.	1906-9.		
WHITES	...	4,495	4,099	=	396 decrease.
S.A.C.	...	6,898	7,041	=	143 increase.
ASIATICS	...	411	430	=	19 decrease.
					<i>increase</i>

It will be seen from this comparison :—

(a) As regards Whites, that the deaths in 1906-9 were less by 396 than in 1903-6 : that deaths from 'diarrhoeal diseases' fell from 817 to 572 (about 30 per cent.) : that 'pneumonia' caused 361, as against 450 deaths (a reduction of about 20 per cent.) : and 'Enteric' 101, as against 256, a very notable improvement of no less than 57 per cent. This may, in part, have been due to the attacks being of a milder type : but the fact that the number of cases notified were only 1,204 as against 2,080 in 1903-6, affords some ground for belief that the efforts of your Health Committee to abate this disease have not been without result. The deaths from 'influenza' fell from 43 to 24, and there were none from 'smallpox.' On the other hand, 'scarlet fever' was not only far more prevalent (1,830 cases were notified as against 480), but was of a quite unusually severe nature, the resulting deaths being 105 (8, 54 and 43) in 1906 9 as against 11 deaths only in 1903-6. The comparative failure of careful preventive measures, both in Johannesburg and elsewhere, *e.g.*, Birmingham and London (*vide* p. 27), is probably due, not only to the occurrence of mild unrecognised cases, but also to the very early infectiousness of scarlet fever, which makes the application of these preventive measures too late. Where, however, it is possible, *e.g.*, by daily medical examination as at the Nazareth House, to detect the first signs and take prompt and thorough measures forthwith, an outbreak, even in a very susceptible community, may often be quickly arrested.

'Measles,' 'whooping cough' and 'cancer' caused respectively 16, 19 and 16 deaths more than in 1903-6, whilst 'heart disease,' for some reason, shews an increase of 46 per cent.

M.O.H. 1906-9

Mortality.

- (b) With regard to South African Coloured Persons, there is unfortunately no indication of a lessened incidence of fatal 'pneumonia' and 'tuberculosis' among mine natives; the deaths from tuberculosis during 1906-9 were 42 per cent. more numerous than in 1903-6, the number of the native population, averaging probably from 73,000 to 78,000 during each of these 6 years. As recently suggested by Dr. G. A. Turner of the Witwatersrand Native Labour Association (*vide* p. 33), the presence of calcified Bilharzia ova in the lungs of many natives in tropical districts probably creates a marked predisposition to attacks by these infections. It is noteworthy, too, that many more deaths (46 as compared with 24) were certified as due to 'miners' phthisis.' Mortality from 'cerebro-spinal meningitis' was also greater by nearly 30 per cent., but the year 1908-9 shews some improvement in this respect. Deaths from 'diarrhoeal diseases' decreased by nearly 40 per cent., while those from enteric were more numerous by 16 per cent. 'Measles' 'whooping cough' and 'suicide or murder' shew a considerable increase.
- (c) With regard to Asiatics, there was a notable decrease of pneumonia mortality (*viz.*, 79 to 29), whilst 'accident' was responsible for 115 deaths, as against 50 in 1903-6; and 'suicide or murder' (chiefly amongst Chinese) for 53 as against 24.

INFANTILE MORTALITY.

By the statistical term "Infantile Mortality" is meant the number of deaths of infants under one year of age per each 1,000 births during a given period, and, in the words of the Registrar-General for England and Wales, Infantile Mortality "has always been regarded as a valuable test for the health of communities." In the following table the rates for Johannesburg are compared with the rates for various English communities, and for the other large towns in South Africa.

TABLE.

MORTALITY OF WHITE INFANTS UNDER 1 YEAR PER 1,000 BIRTHS.

			1899-1903.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.
England and Wales	...	...	146	133	132	145	128	132	118	121	
Urban Counties of England and Wales			159	143	143	158	...	116	106	110	
Rural Counties	do.		120	118	107	117	113				
"76 Great Towns"	do.		..	145	144	160	140				
"141 Smaller Towns"	do.		...	135	135	154	132	138	122	124	
Capetown...	...	...	...	...	168	114	118	129·6	92·1	100·5	
Kimberley	...	...	...	...	...	145	154	125	151	119	106·6
Durban	...	...	...	...	154	100	88	100	69·2	91·7	
Pretoria	..	...	...	...	...	94	...	140	...	99·0	106·0
JOHANNESBURG	...	...	...	...	262	185	153	...	177	140	121 134

It will be noticed that Infantile Mortality has shown a more or less steady decline, reaching in 1907-8 the comparatively low figure of 121, which is below the corresponding rate in the 76 Greater Towns and the 141 Smaller Towns of England and Wales. In 1908-9 the figure rose to 134, but although this is an increase on that of the preceding year, it is lower than that of the first year under review. The increase in question is due mainly to a larger number of deaths from diarrhoeal disorders during the last two months of 1908.

During 1903-6 there were 8,622 births and 1,477 deaths; in 1906-9 there were 10,525 births and 1,391 deaths. These figures correspond to an infantile mortality rate of 171 for the first triennium, and of 132 for the second, which is a very encouraging reduction.

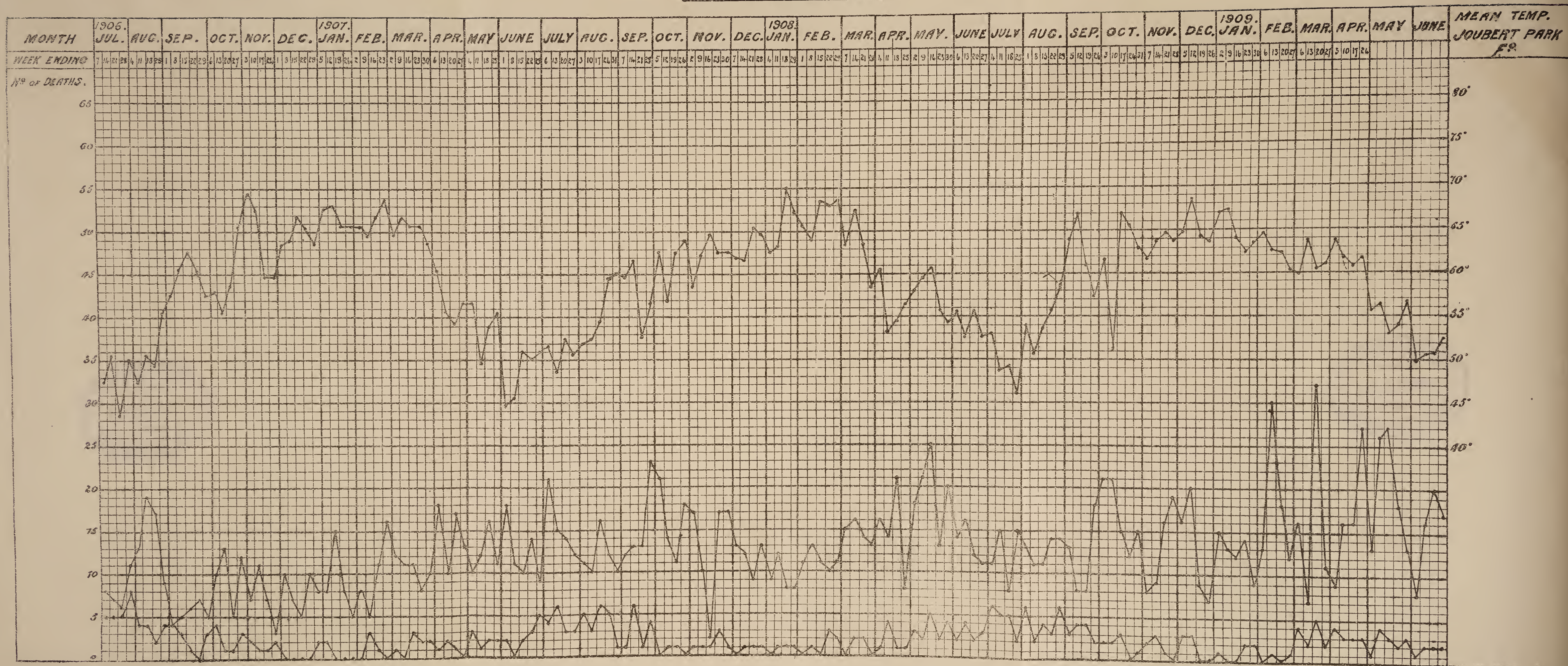
On a previous occasion it was pointed out that diarrhoeal diseases and the effects of malnutrition were responsible for 62 per cent of infant deaths. Early weaning, unsuitable hand-feeding and insanitary conditions of residence, giving rise to food contamination, are potent predisposing causes.



Pneumonia Chart.

(Deaths)

JULY 1906 - JUNE 1909.



— Upper Curve. = Mean temperature Joubert Park. —
 — Middle " = S. A. Coloured. —
 — Lower " = Whites. —

PNEUMONIA.

M.O.H. 1906-9

Pneumonia

The following are the figures as to 'reported cases' and deaths for the period under review :—

YEAR.			WHITES.		S. A. COLOURED.		ASIATICS.	
			Cases Reported.	Deaths.	Cases Reported.	Deaths.	Cases Reported.	Deaths.
1906-7	...	...	320	113	1,421	527	28	6
1907-8	...	..	323	119	2,313	740	31	13
1908-9	...	...	—	129	—	763	—	10

Notification of pneumonia commenced in March, 1904, at the time of the Plague outbreak, and was nominally continued until the 1st June, 1908. There is reason, however, to believe that the notification was far from complete, and the above figures do not therefore afford a reliable basis for the calculation of case-mortality.

The expense involved was considerable, and as will be seen from the accompanying chart, the benefits were problematic.

Should it at any future time be considered advisable, Pncumonia can again be made a notifiable disease by a resolution of the Council if confirmed by the Colonial Secretary.

Since notification has ceased, cases of Pneumonia ending fatally amongst Asiatics, of which intimation is received daily from the Registrar of Births and Deaths, are at once inquired into, in view of the possibility of Plague first appearing in the pneumonic form.

Medical practitioners have also been circularised in reference to this possibility and to the free examination of the sputum of any case to which suspicion may attach.

Extensive measures of disinfection have been carried out in several mine compounds with the approval of the Medical Officer of the mine, where there was an undue prevalence of pnenmonia, and the results on the whole have been satisfactory.

The deathrates per 1,000 from this disease are as follow :—

			WHITES.	S.A. COLOURED.	ASIATICS.	LONDON.
1906-7	...	...	1.1	6.6	0.88	1.4 (1906)
1907-8	...	...	1.2	9.3	1.9	1.3 (1907)
1908-9	...	...	1.3	9.6	1.4	1.4 (1908)

The above figures indicate a slight increase for Whites during the last two years under review, but if compared with the three preceding years, show considerable decrease, and are also less than the figures in London for the corresponding years. Amongst S.A. Coloured and Asiatics, however, the mortality has increased. The higher mortality amongst coloured people generally as compared with Europeans, is probably due to the greater risk of exposure to chill to which these people are subjected.

A very important contribution to the aetiology of pneumonia amongst natives has recently been made by Dr. G. A. Turner (*vide* p. 33), who found that the lungs contained terminal-spined Bilharzia ova (often calcified) in 93 out of 160 autopsies (or 54 per cent.) Sixty-nine of these 160 deaths were from pulmonary disease, and in 70.9 per cent. of these 69 cases the ova were present in the lungs. Dr. Turner thinks that the irritating effect of these gritty particles renders the lungs much more liable to infection with the pneumococcus and tubercle bacillus, and that in some forms of pneumonia they may be the sole cause of consolidation of the lung.

M.O.H. 1906-9

ENTERIC OR TYPHOID FEVER.

Enteric Fever.

Appended are the statistical particulars for the period under notice and the three preceding years :—

YEAR.	WHITES.			S.A. COLOURED.		ASIATICS.	
	Cases.	Deaths.	Deaths per cent.	Cases.	Deaths.	Cases.	Deaths.
1903-4	1,009	126	12·4	—	99	—	5
1904-5	454	46	10·1	266	125	8	1
1905-6	617	84	13·6	232	99	29	7
1906-7	385	42	10·8	342	161	12	6
1907-8	446	31	6·9	348	102	20	5
1908-9	373	37	9·9	296	123	3	3

A large number of imported cases, *i.e.*, persons developing or suffering from enteric, came from outside districts into the hospitals and nursing homes of Johannesburg. Excluding deaths amongst this class (see Tables A-J), the mortality rates from enteric per 1,000 of the population were as follow :—

	1903-4	1904-5	1905 6	1906-7	1907-8	1908 9
Whites	1·3	·4	·7	·4	·3	·3
S.A. Coloured	1·4	1·6	1·4	2·0	1·2	1·5
Asiatics	·6	·09	·8	·9	·7	·4
In the 76 "Great Towns" of England ...	·12	·10	·08	·09	·07	·08

WHITES.—The above rates, so far as they go, suggest at first sight that the present risk to Whites of death from typhoid fever in Johannesburg is about four times as great as it is in the large towns in England, but the comparatively youthful "age-constitution" of the population of Johannesburg must be remembered in view of the fact that typhoid is a disease of youth and early adult life. As pointed out in previous reports, it is therefore reasonable to suppose that if the "age-constitution" of Johannesburg were similar to that of the average English town, the typhoid rate here would be less than the above figures indicate.

Notifications, however, show a more or less steady decline, the figures for 1908-9 being the lowest on record. The case-mortality, too, is not unduly high; in fact, for 1907-8 the figures are remarkably low. It is possible that this case-mortality was due to a proportion of the cases being para-typhoid infections, but this will be referred to later.

The typhoid death-rates for S. A. Coloured are considerably higher than those for Whites, and it is thought that this indicates a greater case mortality amongst those attacked, apart from the question of their susceptibility.

Asiatics also show a higher mortality than Whites for the period under review; and although this is opposed to the experience of the three previous years, it is perhaps not surprising in view of the late stage at which these cases are likely to come under observation and receive proper attention.

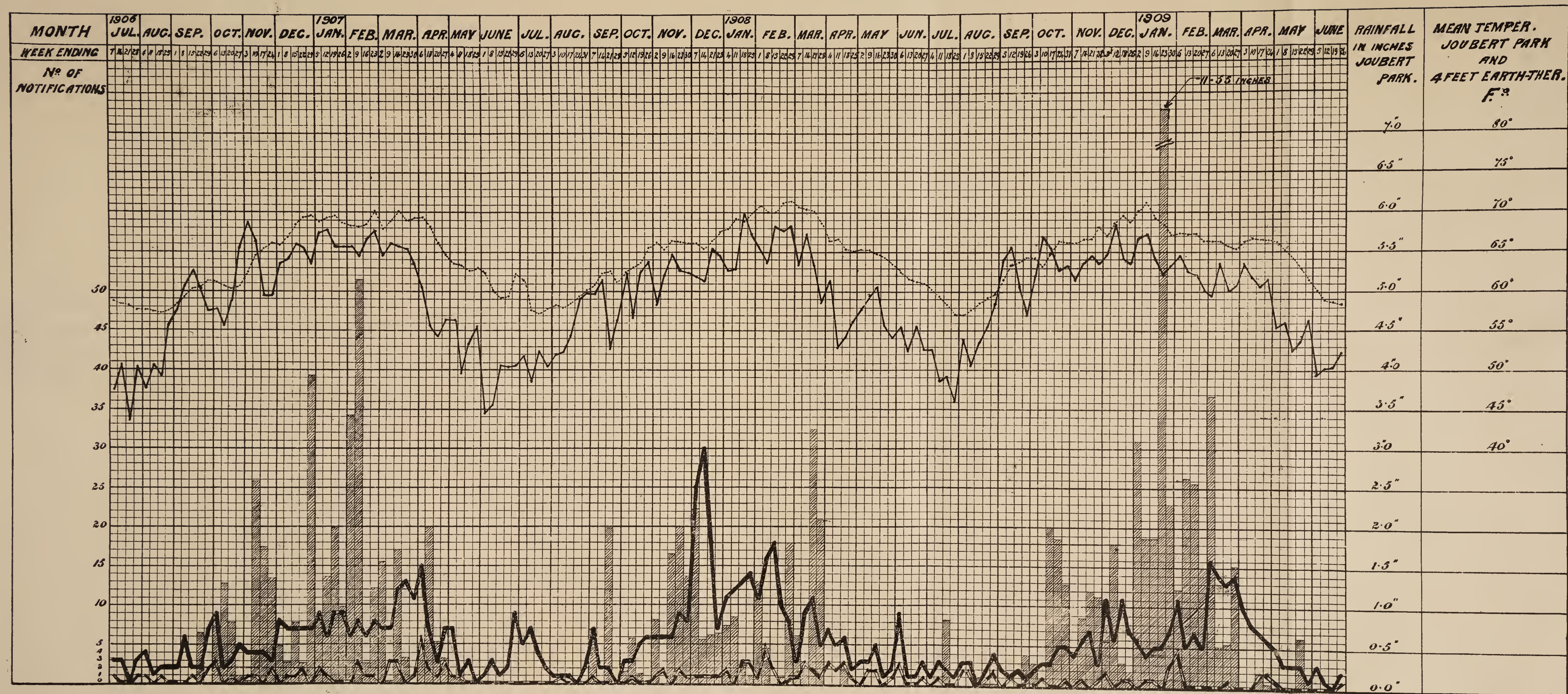
RELATION OF TEMPERATURE, RAINFALL AND LEVEL OF SUBSOIL WATER TO ENTERIC FEVER.

This was referred to in the last report, and there is nothing new to record. Unfortunately, owing to the closing of the old Receiving Hospital in Burgersdorp, which was required for other purposes in connection with the new lay-out of the ground, it was not possible to continue, during the whole period, the observations on the level of the subsoil water. It is hoped, however, that arrangements will be made to resume them at an early date.



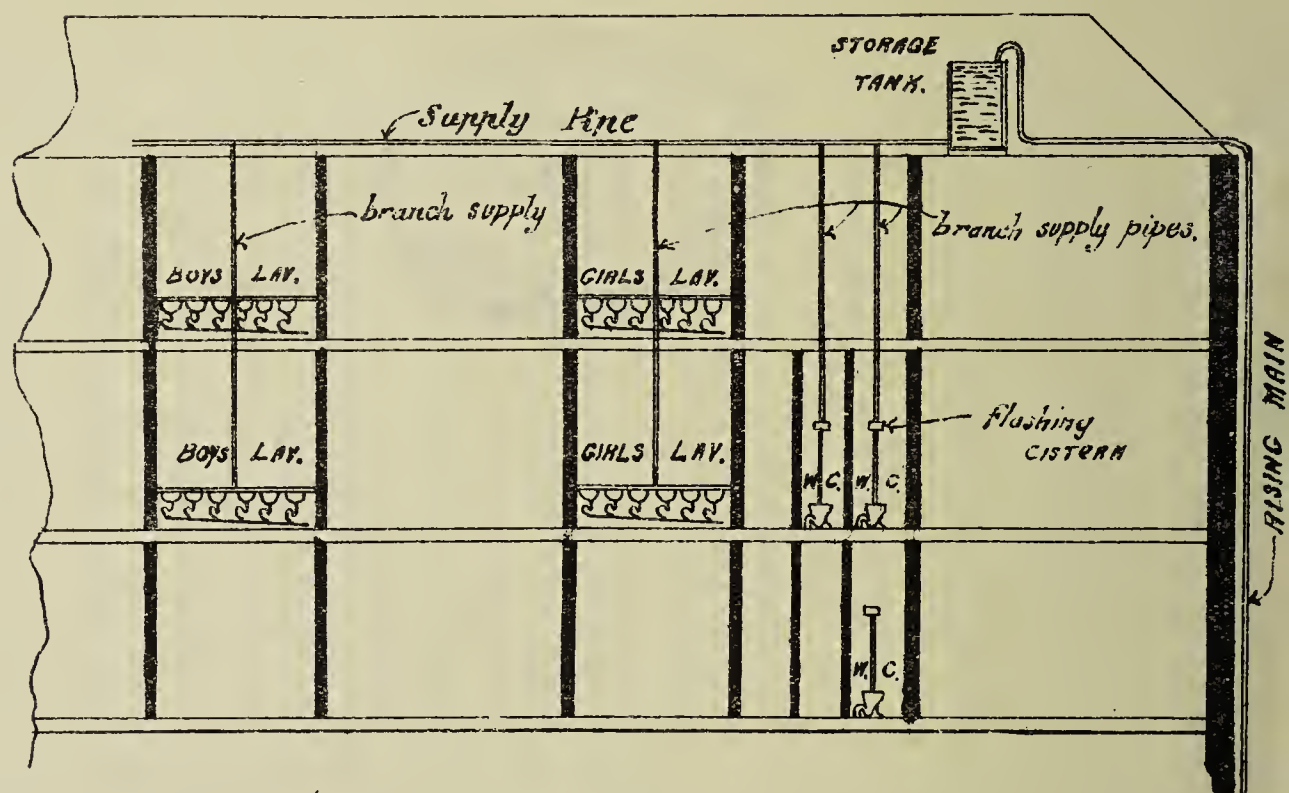
Enteric Fever and Meteorological Chart.

JULY 1906 - JUNE 1909.





— *Sectional Sketch* —
 — *shewing* —
 — *Water Supply, Lavatory Basins, and W.C.'s* —



On chart opposite, a curve has been traced shewing for each week the number of cases in which the sufferers obtained their water-supply from shallow wells. This does not show any definite relationship either to the total number of cases or to the rainfall. On the other hand, it must be remembered that many of the wells in Burghersdorp and the urbanised portion of the town, which have undoubtedly caused Enteric in the past, have been closed, and water from the town mains laid on to the premises concerned. It was noteworthy, however, that the rise in the curve during the week ending February 6th, 1909 had been preceded a fortnight earlier by the exceptional rainfall of over $11\frac{1}{2}$ inches, and pollution of many of the remaining wells must have resulted.

Careful inquiry into the majority of cases fails to disclose the source of infection, but direct infection (by personal contact) from previous sufferers are not uncommon, and there is no doubt that infection by "carriers" (vide p. 16) plays a much larger part in the persistence and spread of enteric than has till recently been recognized.

The following outbreaks of the disease traced, however, in most cases to a definite source, require further notice :—

I.—ENTERIC FEVER AT THE NAZARETH HOME—In June, 1907, 14 mild cases of Enteric Fever occurred at the Nazareth Home and on inquiry it was found that the water-supply had probably become contaminated by drain air and by emanations from choked water-closets.

The height of the building had recently been increased by the addition of an extra storey, but extension of the high service system of water supply to this addition could not at once be made, and a large storage tank was provided in the roof, which was slowly and intermittently filled by town's water from a lower reservoir. The rising main discharged into the top of this tank, while from the bottom was taken off the supply pipe, which ran along the whole length of the roof. From this supply pipe the flushing cisterns of two closets were served, and also the taps to the girls' and boys' lavatory basins, from which, as was afterwards ascertained, the children, more especially at night time, were in the habit of drinking.

If the pressure fell at all in the rising main, the storage tank was on occasion empty, and consequently the flushing cisterns for the closets were also empty, the ball-cocks on the branch pipe from the supply-pipe being then left open. Hand flushing of the closets was resorted to, but in a perfunctory manner, and the closet traps were often unsealed and dejecta left drying in the pans.

It is believed that drain air and effluvia from the pans were sucked up the flush-pipes into the cisterns, and possibly also entered through openings in the covers of the cisterns, passing from thence up the cistern service-pipes, into the supply-pipe common to the closets and lavatories, and from thence possibly to the storage tank itself.

This local contamination of the supply-pipe or the storage tanks served as a nidus of infection, the water to the lavatory-basins—which was drunk by the children—being thus contaminated. The diagram shows the arrangement of the pipes, etc.

II.—ENTERIC FEVER—DOORNFONTEIN POLICE STATION.—A group of 5 cases arose at the Doornfontein Police Station in Beit Street in the week ending September 7th, 1907. In one instance, the fever was probably contracted elsewhere. As regards the others, nothing could be ascertained implicating any article of food or drink, but the men's latrines were unpleasantly near the dwelling, were not of a good type, especially as regards ventilation, and were not kept particularly clean. These conveniences were disinfected and greater care enjoined, and the outbreak ceased.

These cases account for the unusual rise in the curve at this season of the year.

III.—ENTERIC FEVER—JUMPERS DEEP AND TREASURY.—In November, 1907, a group of 8 cases arose, comprising 6 underground and 2 surface mine workers at Denver, namely, 7 at the Jumpers Deep and 1 at the Treasury. Detailed inquiry was made into the sanitary circumstances under which these men lived and worked, the drinking water was chemically and bacterially examined, and the source of the milk-supply reported on. It was stated that formerly there had been a good deal of excremental soiling of the Jumpers Deep Mine, and all of the underground workers admitted having drunk underground water. In addition, the town-water supplied to the whites on the mine was conserved in a large open tank, and was obviously open to wind-borne pollution. From a consideration of the known circumstances, it is thought that the infection in these cases was conveyed by locally contaminated water used for drinking purposes. These cases are not particularly reflected in the curve, but form part of the general rise which takes place about this time.

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Enteric Fever.

IV.—ENTERIC FEVER—ROBINSON MINE—PROBABLE INFECTION BY “CARRIER.”—

In December, 1907, 31 cases occurred chiefly amongst officials and employees at the Robinson Mine, and connected therewith—in respect to community of cause—were several attacks in other parts of the town.

The history of the outbreak is briefly as follows :—

On the 14th December a bank clerk sickened in Delfers Street, City & Suburban. On 16th December, Dr. Irvine notified a batch of 12 cases at the Robinson Mine; these were followed by two cases on the 18th; 2 on the 20th; 2 on the 21st; 3 on the 23rd; 3 on the 24th; 1 on the 27th, and 1 on the 30th December. In addition, two certificates were received on the 1st, and one on the 4th January. The date of onset of illness varied from the 4th-17th December. Of the 31 sufferers, 18 were males and 13 females. As regards locality, 16 arose on the Robinson property, 5 in Fordsburg, 2 on the Ferreira Deep, 2 in Marshalls, and 6 in Ophirton and Booyens. The majority of attacks were of a mild nature.

Immediately on receipt of Dr. Irvine's message on the 16th December, personal investigation was commenced by the M.O.H., and it became apparent that, as suspected by Dr. Irvine, the only circumstance common to the 12 cases reported was the source of the milk-supply, viz., a dairy carried on by Mr. T.N. in Booyens Reserve. The 19 sufferers who were subsequently notified, also got their milk from the same dairy; in one instance alone was the milk boiled previous to use, and in that only occasionally.

The dairy thus implicated was visited on the afternoon of the 16th December. The premises were above the average as regards cleanliness, but there was evidence of carelessness on the part of the Hottentot who put out the cardboard discs used to stop the milk-bottles. On the 17th December, the cows were pronounced by the M.V.S. to be quite free from any signs of disease, and up to that time there had been no known sickness amongst the dairy-man's family or natives. The source of the water-supply to the dairy was twofold, viz., an unlined well about 40 feet deep, the water from which was said to be used only for washing floors and watering cattle; and, secondly, a tap from the public main to Booyens Reserve; the M.O.H. was informed that the water from this main was boiled and then used for washing the bottles and dairy utensils, but not for household purposes as “it was often dirty and tasted of tar.”

At the time of the M.O.H.'s visit, nothing definite could be alleged against the dairy except that 12 cases had occurred amongst the list of 90 dwellings to which 168 bottles of milk per day were supplied, and it was quite possible that some of these 12 might have contracted the disease from another source. The possibility of one of the persons engaged in the dairy acting as a “carrier” was, therefore, considered, and in view of the manner in which natives move from employer to employer, special attention was directed to them.

On December 21st, the bacterial report on the blood from the licensee of the dairy and the three natives engaged on dairy work, was received, the results suggesting that one of the natives was a “carrier” of infection. He was at once removed to the Johannesburg Hospital and kept under observation, but for several days the results of examination of his discharges did not confirm the suspicion raised by his blood reaction. Typhoid germs were, however, afterwards found in the bowel discharges, and there could be little doubt that he was the proximate cause of the outbreak.

The dairy, as already stated, was supplied with water from (a) a shallow well, and (b) the public main to Booyens Reserve. As regards both of these waters, the results of chemical analysis were quite satisfactory. Bacterial examination, however, shewed that the shallow-well water contained 132 organisms per c.c. growing at 37° C., and B. Coli in 1 c.c., while the water from the main contained 8 organisms per c.c. at 37° C., and B. Coli in 6 c.c. Subsequently, however, Dr. A. May, then Government Bacteriologist for the Transvaal, isolated, in the first place during routine bacterial examination, and afterwards by a process of concentration and enrichment, a paratyphoid organism from the “main water,” and ultimately traced this organism to one of the Rand Water Board's wells at Zwartkopjes in the Klipriver Valley. This well is situated about 40 yards from the Klip River “vlei” or marsh, and consists of a shaft 15 feet in depth with lined sides of cement concrete, containing the necessary parts of the pumping machinery. An 18 inch bore-hole, steel-cased for 53 feet, is sunk from the bottom of this shaft to a depth of 141 feet. A smaller bore-hole continues from this for a further 42 feet; making the total depth from the surface, 183 feet. The greater part of this borehole is sunk through dolomite. To quote Dr. May: “There is apparently no impermeable stratum between the surface and the point from which the water is drawn. From the fact, as reported by those in charge, that the supply was unaffected by rainfall, the collecting area was judged to be a large one. The water-bearing dolomite was reported to be covered by a loam varying in thickness from 20 to 60 feet. It would therefore seem that the filtration of water percolating from the surface should be sufficient, and that the contingency of surface contamination might be disregarded. There was, however, one condition present which might be looked upon as

“doubtful, viz., the splashing from the pump at each return of the piston. The return water M.O.H. 1906-9
 “from this source had apparently no other outlet than to percolate back in the direction of the Enteric Fever.
 “borehole. As there was necessarily a certain amount of traffic in connection with the pumping
 “machinery at this position, and at or about the same time that the specific organism was
 “isolated some repairs were being carried out in connection with the pump, contamination from
 “this source would seem a possibility.” The sanitary convenience was a pit about 18 inches in
 depth some 80 yards distant from the pumping house: and whilst it is not absolutely impossible
 that it may have been a source of pollution, it was certainly very highly improbable from its
 nature and position that it had so acted.

“The results of the routine bacterial examination of the water from this well for the
 “5 weeks during which it was under suspicion are given below. They shew the absence of
 “gross contamination of any sort, and compare very favourably with other sources of supply in
 “the same locality about which there was never any suspicion of specific contamination.

“*1st week.*—7 organisms per c.c. growing at 37° C.; B. Coli communis not found in
 “10 c.c.; streptococci not found in 10 c.c.

“*2nd week.*—3 organisms per c.c. growing at 37° C.; B. Coli communis not found in
 “10 c.c.; streptococci not found in 10 c.c.

“*3rd week.*—6 organisms per c.c. growing at 37° C.; B. Coli communis present in
 “1 c.c.; streptococci not found in 10 c.c.

“*4th week.*—5 organisms per c.c. growing at 37° C.; B. Coli communis present in
 “1 c.c.

“*5th week.*—4 organisms per c.c. growing at 37° C.; B. Coli communis present in
 “3 c.c.

“The following are some of the points with regard to the chemical analysis of this
 “sample which are shown in the report of the Government Analyst for the Transvaal (Dr.
 “J. McCrae), frequent examinations being made by him during the time the water was
 “under suspicion.

“(1). The turbid appearance of the water as compared with other waters drawn from
 “boreholes in the same district, due partly to the oxidation of the iron in solution on exposure,
 “and consequent precipitation of hydrated ferric oxide, and also to some extent to clay held
 “in suspension.

“(2). The fairly constant amount of chlorine (0.4 parts per 100,000), sufficient to
 “indicate that there has been no gross contamination from animal sources.

“(3). The excessive amount of saline ammonia, albuminoid ammonia, and oxygen
 “absorbed, the last of these being to some extent discounted owing to the presence of dissolved
 “iron.

“(4). The maximum amount of saline ammonia found in this water was 0.0144 part per
 “hundred thousand and the minimum 0.0036. The albuminoid ammonia varied from 0.0076
 “to 0.0024, while the average amounts of saline and albuminoid ammonias in samples from
 “boreholes in the same district is placed at 0.0001 and 0.0002 respectively.

“(5). The hardness in the samples from this and other boreholes in the district would
 “give reasons to expect approximately the same quality of water from all, whereas the quality
 “of this water from a chemical standpoint was distinctly inferior to that of the water drawn
 “from other boreholes in the vicinity and on the same geological formation.

“(6). The presence of a considerable quantity of algæ growth, and its decay, in this
 “source would to a great extent account for the relatively high amount of nitrogen present.

“The source of this infection must remain a matter of conjecture, as besides the
 “unlikelihood of faecal or sewage contamination, as judged by the physical aspect of the source
 “of supply, the results obtained both chemically and bacteriologically in the search for definite
 “evidence for such pollution, as detailed above, would seem to negative its possibility, and the
 “more likely source would seem to be a urinary contamination. With this idea in view, the
 “bloods of most, but unfortunately not all, of the workers at this borehole were tested for
 “agglutination powers with this and several other strains of the paratyphoid and typhoid
 “organism, but with negative results. The urines of these men were also examined with the
 “object of isolating the organism if present, but also with negative results.”

The further question naturally arises whether the milk-borne outbreak under notice was
 indirectly due to water from A1 borehole, or whether the native who was found to be acting as
 a carrier had contracted the disease from some other source. Against the former hypothesis are

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Enteric Fever. the following facts, namely : the paratyphoid organism was present in very small quantity ; it was unassociated with other organisms indicative of recent and dangerous pollution, and the proof that it is a disease-producer is considered by some to be incomplete : the same water was being supplied to many thousands of other people throughout the town of Johannesburg, but there was no undue prevalence of enteric, except amongst customers of this dairy ; and finally, there are various other sources from which the native in question may have contracted the disease, and it is well-known that natives very commonly suffer from this disease in its ambulant form.

The water from this well was cut off on the 5th February, 1908, and in the following three weeks a marked fall took place in the curve of enteric fever prevalence ; but that this was not necessarily a case of *post hoc propter hoc* is shewn by the fact that there was a closely similar fall during the same period of the previous year.

In the foregoing record of this interesting outbreak, the M.O.H. has freely quoted from a paper by Dr. A. H. May, "On the Isolation of a Paratyphoid Bacillus from a Drinking Water Supply," published in "The Journal of the Royal Institute of Public Health," September, 1909, and desires gratefully to acknowledge the help and support afforded by Dr. May and Dr. McCrae (Government Analyst), as well as by Majors Buist and Statham, R.A.M.C., both of whom examined and reported on the source of supply and the yield of the well.

V.—ENTERIC FEVER—NORWOOD.—During May and the first part of June, 1908, there arose in Norwood a small outbreak of 10 cases, to which the rise in the curve for the week ending June 6th is to be attributed.

The dwellings in which attacks occurred lay south of Nellie Road and a little north of a line drawn east and west past the northern boundary of the quarry and roughly following the outcrop line of granite. The granite here apparently dips from south to north and the wells are sunk through superficial soil and decomposed granite, the water being met with at a depth of about 20 feet. The only community of circumstances in regard to these cases was that eight of the sufferers were known to have drunk water from wells which were neither lined nor properly protected and obviously open to surface contamination. Moreover, in former years, it is stated that the ground in the vicinity was used as a depositing site.

From a sample of water, however, collected on June 17th, 1908, from one of the wells, a bacillus of the typhoid group resembling *B. Para-Typhosus* of Schöttmüller was recovered.

With a view to ascertaining whether the whole underground supply had been contaminated by this bacillus and consequently given rise to the outbreak, attempts were made to obtain samples of blood from the different patients so that their agglutinating powers might be tried against the bacillus isolated from the well. Unfortunately no satisfactory results could be obtained.

Norwood, like other suburbs in the north-eastern area, depends for its water supply on shallow wells, and a stand-pipe was accordingly erected at the commencement of the outbreak from which the town water could be obtained free of charge.

It is extremely desirable that the existing shallow wells be closed, and replaced by a reticulation from which the town water can be obtained.

VI.—ENTERIC FEVER—SOUTHERN SUBURBS.—PROBABLE INFECTION BY "CARRIER."—In the week ending March 6th, 1909, a sharp rise is noted in the Enteric curve. This rise and its continuation during the following week is accounted for by an outbreak of 21 cases, milk-borne in character, which occurred in the Southern Suburbs.

This outbreak was dealt with by Dr. P. G. Stock, then Acting M.O.H., and is described by him as follows :—

On March 6th, a notification was received from Dr. Blieden that a Miss S., residing in George Street, Rosettenville, was suffering from Enteric Fever. The customary inquiries were made, but nothing unusual was elicited. On the 8th March, however, Dr. Alport notified that he was attending four cases of Enteric, three being in Turffontein and one in Booyens, and a fifth notification was received from Dr. Hunter in respect to a Mr. X., also in Turffontein. Mr. X. was a dairyman carrying on a somewhat extensive trade in the district. He was removed to hospital the same day, and the whole premises thoroughly disinfected.

Inquiries into the other cases, together with the one reported on the sixth, revealed the fact that four of the patients obtained their milk from X.'s dairy. The fifth case lived in Booyens, had been ill since the 1st February, obtained milk from another source, and need not further be considered in connection with this outbreak.

The following morning two more cases were notified, one from Turffontein and one from Forest Hill. In each of these it was found that the drinking water, which was unboiled, was obtained from rain-water tanks, the town water not being laid on, and that milk was obtained from X.'s dairy.

There being no obvious reason why Mr. X. should have contracted the disease, the premises were visited on March 10th by the Acting M.O.H., who ascertained that Mr. X. had been taken ill on February 25th on returning from a short visit to Krugersdorp.

As the incubation period of Enteric Fever is roughly about a fortnight, he presumably became infected in Johannesburg about the 10th February. About this time it appears that a native named John, who was employed in herding and milking the cows, had been sick, but had since left his situation and returned to his kraal near Dundee, Natal. After very great difficulty this native was traced and, thanks to the ready assistance of the Resident Magistrate, Dundee, a sample of his blood was obtained and sent to the Government Laboratories for examination. M.O.H. 1906-9
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In the meantime, samples of blood had been collected from Mrs. X. and her three children, a white man in charge of the dairy, and three natives employed on the premises. The blood examinations were negative as far as Enteric Fever was concerned, with the exception of one of the dairyman's children and a native named Picannin. The child appeared to be out of sorts, and was accordingly removed to hospital, where it was eventually found to be suffering from Enteric Fever. The native Picannin was to all appearances in perfect health, and had been employed by Mr. X. for the last two years. In view, however, of his blood reaction, he was sent to the Johannesburg Hospital for detention pending further examination.

The steps taken to deal with the outbreak were as follows :—

1. The dairyman and afterwards one of his children and the native Picannin were removed to the Johannesburg Hospital, the premises being thoroughly disinfected.
2. Samples were taken for chemical and bacterial examination both of the water from the main and the rainwater tank, the latter being then emptied and disinfected. Samples of milk were also sent to the Government Bacteriologist, but with negative results.
A list of customers was obtained and handbills were left advising that all milk be boiled before use.
4. The cows were examined by the M.V.S. and passed as healthy.
5. The cowsheds and premises generally were specially cleaned and disinfected ; and all the dairy utensils and bottles were carefully disinfected by your Disinfector.
6. Specimens of the blood of all persons engaged on the premises were collected and submitted for bacteriological examination with regard to the possibility of there being a "carrier" amongst them.
7. The milk supply was allowed to continue on the emphatic condition that all utensils, bottles, etc., were thoroughly cleaned in boiling water and that every care was exercised in regard to the conduct of the business, the premises being visited daily by the District Inspector. The reasons for this decision were
 - (a) That enteric is not so far as is known, conveyed through milk, unless it becomes contaminated after leaving the cow.
 - (b) That any causes which might have contaminated the milk had been removed.
 - (c) That there was no reason to mistrust the white man in charge and the premises could be kept under daily observation by the Department.

It was pointed out, however, that cases which had been infected previous to the precautions taken might be expected to occur until about the end of the month, as indeed was the case, the last notification being received on March 23rd. In all, twenty-one cases occurred with two deaths, giving a case mortality of 9·5 per cent.

On March 18th. Dr. Mitchell, the Government Bacteriologist, reported that he had succeeded in isolating a pure culture of one of the typhoid group of bacilli from the urine of the native Picannin. Cultures of this organism were made and afterwards tested against specimens of blood obtained from fifteen of the twenty-one cases, a positive reaction being obtained in thirteen (which included both Mr. X and his child), the remaining two being negative.

It thus appeared that the causative agent in the case of Picannin and at least thirteen of the twenty-one sufferers had been the same.

Picannin had from all accounts enjoyed good health during the previous two years. If, as appears likely, he was the cause of the outbreak, he had probably suffered from the disease previously and, harbouring the germs in his body, had acted as a "carrier."

There is no doubt, however, that on the 18th March Picannin would have been a serious danger to the community had he not been isolated in hospital.

With regard to the native John, who was traced to Dundee, the specimen of blood obtained only gave a more or less feeble reaction with an ordinary strain of typhoid, and as no further history could be obtained, it is difficult to say what his illness was in February. Possibly it may have been enteric fever ; but, even if this were so, he would appear to have been infected by a different member of the typhoid group to that infecting Picannin.

The question of treating such cases so as to render them harmless is extremely difficult, as the administration of drugs seems to have little or no effect. If, however, the natural resisting powers of the body can be sufficiently raised, the blood itself will destroy the germs and the person infected will cease to be a "carrier." Treatment on these lines was accordingly

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carried out in the case of Picannin, a vaccine being prepared from the organism isolated from his urine. The results apparently were successful, and the boy was discharged from hospital on the 18th June, repeated examinations showing that he was no longer excreting the organisms and was apparently cured.

The above outbreaks show some of the difficulties which are experienced in the prophylaxis of Enteric.

Our present-day knowledge of Enteric Fever and the lines to be followed for its prevention are well summed up by the Specialist Sanitary Officer of the Transvaal District (Major Buist, R.A.M.C.) in his report for 1907.

EXTRACT FROM ARMY MEDICAL DEPARTMENT REPORT FOR THE YEAR 1907.

VOLUME XLIX.

Enteric Fever.—"The extremely complex nature of the epidemiology of this disease is becoming more apparent every day, and owing mainly to the researches of German workers many of the older theories must be modified to bring them into line with present-day knowledge. Only a few years ago the term enteric or typhoid fever was restricted to cases presenting a definite clinical picture of the typhoid state and presenting definite enteric lesions. We now know that the clinical symptoms and lesions, termed typhoid or enteric fever, accompany only one phase of this disease. To further complicate matters, the *Bacillus typhosus* (of Eberth) can no longer be regarded as the sole causative agent. Quite a number of bacteria allied to but distinct from the *B. typhosus* have been proved capable of producing typical typhoid symptoms with Enteric lesions. . . . The problem of the prophylaxis of this disease is as complex as are its epidemiology and its bacteriology. . . . In enteric fever research has only added to the complexity of the problem, and no predominant factor has been discovered in its aetiology on which certain preventive measures can be based. . . . In this country (South Africa) for practical purposes it is safer to assume :—

1. That no water or milk is fit for drinking until it has been boiled or otherwise sterilized.
2. That the protection of food supplies from dust and flies is an essential, and that scrupulous cleanliness is necessary. Uncooked vegetables from unknown sources are particularly dangerous.
3. That all febrile cases, whose nature cannot at once be determined, should be treated for preventive purposes as though they were cases of true enteric fever. Isolation and disinfection should in such cases be insisted on.
4. That the care of convalescents from the disease and of "Bacilli carriers" is very important.

TYPHOID "CARRIERS."—In view of the extent to which "Typhoid-carriers" are believed to have been responsible for the prevalence of this malady during the period under review, it may be well perhaps to explain what is meant by this term.

A "carrier" is a person who, although not actually suffering from the disease, harbours the germs in his body and is capable of conveying it to others. Formerly, it was thought that the germs of Typhoid could exist outside the human body for considerable periods, but the work of Koch and others tends to show that the saprophytic existence of the germs of Typhoid Fever outside the body, is very short. The researches of Morgan and Harvey throw some light on the reason of the discrepancy in the results of different observers as to the length of time which the germs may exist outside the body. Most observers worked with laboratory subcultures of the germs; but Morgan and Harvey, working with the bacillus as it is passed in nature in the excreta of Enteric convalescents and chronic "carriers," found that the germs quickly died out after leaving the human host.

This view, if confirmed, emphasizes the importance of the "carrier" as one of the chief causes of infection; and, in this connection, it will probably be found that natives play by far the most important part in the endemicity of Enteric Fever in South Africa.

From the foregoing considerations, the importance of the rapid removal of the excreta of Enteric patients, and the prevention of promiscuous defaecation by natives, becomes very obvious.

The difficulties and expense of dealing with "carriers" in a satisfactory manner are enormous. It must be remembered that in most cases the "carrier" is, to ordinary observation, in perfect health, and it is only after a careful and delicate bacterial investigation that he can be shown to harbour germs. Even then the problem arises as to what is to be done: while living unrestricted he is undoubtedly a danger to the public; on the other hand to isolate him on a large scale in a similar way to that adopted by the Army Authorities at Milbank and elsewhere, would probably involve an expenditure which few States could bear.

The germs are usually excreted from the bowel, and in such cases treatment with Lactic Acid Bacilli has been tried, but with only limited success. The administration of Medicinal

Izal Oil as a preventitive to bacilluria in Enteric Fever is highly spoken of by Dr. Gordon,* the M.O.H. 1906-9 Medical Superintendent of the Monsall Fever Hospital, Manchester, and a supply is being Enteric Fever. obtained for experimental purposes.

In other cases, patients have been injected with a special vaccine prepared from Typhoid Bacilli ; but the course of treatment which probably gives most hopes of a permanent cure, is that adopted by Dr. Mitchell and the Assistant M.O.H. (Dr. Stock) in the case of a native picannin who was the primary cause of the outbreak in the Southern Suburbs (v. pp. 15 and 16).

In this instance the particular strain of the Typhoid organism with which the native was infected was first isolated and a vaccine then prepared.

Communications are now passing with the M.O.H., Transvaal, with a view to arranging some common plan of action *re* "Carriers" ; and, in view of the importance of the subject, an application may be made to the Public Health Committee at a later stage, for a grant to assist in undertaking a further investigation into the pathology and epidemiology and the "Typhoid-Carrier" question.

Extremely valuable and interesting research in reference to Enteric is being carried out at the Bacteriological Laboratory at Robert's Heights, Pretoria, by Major Statham, R.A.M.C., and the result of his observations in 1907, which are the only ones at present to hand, show that no less than 20 per cent. of the organisms isolated were atypical. As a general rule the atypical bacilli do not produce a disease in such a severe form as the common organism. Presumably, therefore, the low mortality in 1907-8 was due to a large proportion of the cases being para-typhoid infections.

DIARRHŒAL DISEASES.

The following are the mortality figures for the period under notice :—

	WHITES.						S. AFRICAN COLOURED.						ASIATICS.					
	1903-4	1904-5	1905-6	1906-7	1907-8	1908-9	1903-4	1904-5	1905-6	1906-7	1907-8	1908-9	1903-4	1904-5	1905-6	1906-7	1907-8	1908-9
Diarrhœa and Dysentery	313	170	277	209	137	180	312	247	259	249	132	134	4	4	18	11	8	4
Enteritis	3	37	10	6	8	32	12	43	2	4	7	20	3	—	1	—	—	2
	316	207	287	215	145	212	324	290	261	253	137	154	7	4	19	11	8	6
	810			572			908			546			30			25		

DEATH RATE PER 1,000 OF POPULATION LIVING.

	WHITES.	S. A. COLOURED.	ASIATICS.	76 GREAT TOWNS IN ENGLAND.
1903-4	3·82	4·77	·89	·83
1904-5	2·49	3·83	·39	·83
1905-6	3·34	4·18	1·26	·83
1906-7	2·26	3·21	1·62	1·16
1907-8	1·52	1·76	1·18	·4
1908-9	2·22	1·95	·88	·65

The proportion of the foregoing deaths which took place amongst the children under five years of age of the different races was :—For Whites, 90 per cent. ; S.A. Coloured, 32 per cent. ; Asiatics, 56 per cent.

As regards both S.A. Coloured and Asiatics in Johannesburg, it must, however, be remembered that comparatively and absolutely there are very few children. While, however, the proportion of deaths under five years for Whites and S.A. Coloured is about the same as for the period previously reported upon, the total actual mortality 'at all ages' is steadily decreasing. The fact remains, however, that diarrhœal diseases are the chief cause of death amongst children under five years.

* See Practitioner, August, 1908.

M.O.H. 1906-9
Diarrhoeal
Diseases.
Meningitis.

M. Metchnikoff, of the Pasteur Institute, recently communicated to the Académie de Médecine the nature of the results of his researches on infantile diarrhoea, which he was led to study in the course of his researches on the part played by intestinal microbes in the production of premature old age. He was struck by the constant and abundant presence of *Bacillus proteus* in the stools of infants suffering from diarrhoea, and tried to discover how they became infected with this microbe. *Bacillus proteus* is rarely found in cow's milk, not once in ten samples bought in different Paris creameries; and, moreover, diarrhoea occurred in a number of breast-fed infants. The cause was, therefore, not in cow's milk; the infection was communicated by the persons who cared for the infants. M. Metchnikoff found the bacillus proteus frequently in the stools of healthy adults during the autumn months, and also in the faecal discharges of many animals (cow, horse, dog, cat) on the surface of meat, and on the outside of certain cheeses, but especially on vegetable foods, *e.g.*, salads, radishes and grapes. M. Metchnikoff considers that during the hot weather, flies transport the microbes from the dejector of animals on to the food they prefer, especially cheese and grapes, which, being consumed without disinfection, introduce the microbes in quantity into the intestines of persons who, being in constant contact with infants, contaminated them. To prevent infection of infants, he suggests that the breasts of the parent should be well washed with soap; that fruits and vegetables should be dipped for a few seconds in boiling water, and that cheese should be eaten toasted. He also mentions the cleaning of streets and destruction of flies as valuable prophylactic measures (B.M.J., December 4th, 1909, p. 1649).

MENINGITIS.

The characteristics of this disease were fully dealt with in the last report (see p. 20-24).
The registered cause of death and age periods are set out in the following table :—

DEATHS—1906-1909.

Registered Cause.			All Ages.	- 1	- 5	- 15	- 25	- 65	+ 65
Meningitis	...	{ Whites ... Natives ... Asiatics ...	60	32	19	3	2	4	...
			331	8	5	2	190	126	...
			1	...	...	...	...	1	...
Cerebral Meningitis	...	{ Whites ... Natives ... Asiatics ...	1	...	...	...	1	...	...
			23	...	1	...	12	12	...
		
Cerebro-spinal Meningitis	{ Whites ... Natives ... Asiatics ...	29	4	6	8	2	9	..	
		244	4	3	1	131	105	...	
		3	...	1	...	2	...	...
Totals	...	{ Whites ... Natives ... Asiatics ...	90	36	25	11	5	13	..
			598	12	9	3	333	241	...
			4	...	1	...	2	1	...
			692	48	35	14	340	255	...

With regard to the results of bacterial examination of 326 suspected cases of meningitis from 1st July 1906 to 31st December, 1909, Dr. J. Mitchell, Government Bacteriologist, has kindly furnished the following figures :—Meningococcus present in 113 cases; pneumococcus in 68; meningococcus and pneumococcus in 0; streptococcus in 18; pneumococcus with streptococcus in 1; none of the foregoing in 126.

Amongst Whites.—Of the 90 deaths, 72 were amongst persons under 15 years, 61 being very young children.

Amongst Natives.—It will be noted that of 598 deaths, 331 were referred to “meningitis,” and only 244 to “cerebro spinal meningitis”; but, as the disease was clearly present in epidemic form, there is little doubt that deaths from primary meningitis amongst nine natives over the age of 15 years were really cerebro-spinal meningitis. Such deaths include 574 of a total of 598, the age incidence of mortality being just the reverse of that amongst the white population, owing to the great number of young adult natives engaged on the mines.

Taking the deaths from cerebro-spinal meningitis as 574, it is found that 66 occurred in the town, 5 were imported, and in one case no address could be obtained,

The remaining 502 were in the Native Labour Association Receiving Hospital and in the Compounds of the various mines within the Municipality as shewn below :—

M.O.H. 1906-9
Meningitis.

July, 1906—June, 1909.

W.N.L.A. Hospital ...	218	Village Deep ...	12
Langlaagte Deep ...	27	New Heriot ...	—
Crown Deep ...	45	Wemmer ...	4
Robinson ...	18	Jubilee and Salisbury ...	9
Village Main Reef ...	5	Meyer and Charlton ...	10
Robinson Deep ...	15	Wolhuter ...	11
Ferreira Deep ...	7	Nourse Mines ...	18
Crown Reef ...	16	Langlaagte Consolidated ...	—
Langlaagte Estate ...	12	Ferreira ...	20
Jumpers ...	9	Treasury ...	3
New Goch ...	21	City and Suburban ...	14
Bonanza ...	8		
	401		502

The ‘Place of origin’ of the 598 natives who died from Meningitis during the period under notice is shown as follows :—

Portuguese East Africa ...	397
Transvaal ...	35
British Central Africa ...	29
Natal ...	26
Cape Colony ...	19
Orangia ...	15
Basutoland ...	14
German East Africa ...	4
Rhodesia ...	2
Unknown ...	57
	598

Although the East Coast mine boys have furnished the largest number of victims, namely 397 out of a total of 574 deaths of mine natives, it does not necessarily follow that their susceptibility is very much greater, for their number is large, and includes from 70 to 75 per cent. of underground workers and probably 50 per cent of surface boys. On the other hand, 38 per cent. of the cases occurred in the W.N.L.A. Compound, where each batch of recruits from the East Coast is sent for medical observation on arrival in Johannesburg. This Compound has been repeatedly and vigorously disinfected by the Public Health Department, and at other times under the direction of the Medical Officer (Dr. G. A. Turner, D.P.H.), but cases and groups of cases continue to crop up at irregular and somewhat long intervals.

On arrival in Johannesburg, each batch of recruits is sent direct for medical observation to the Witwatersrand Native Labour Association’s Compound. Some 414 cases with 329 deaths occurred amongst recruits thus inspected, and the following figures show the number of days which elapsed between their arrival and admission to hospital :—

Days	...	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	+ 28
Cases	...	1	14	8	7	14	23	19	20	29	24	39	28	19	20	25	15	16	11	16	12	4	6	3	4	2	3	2	5	1	24

The date of incubation is not known, but it will be seen that nearly three-fourths (290) of these cases developed within 14 days of arrival. It is also probable that some natives contract the disease before reaching the Rand. Possibly the marked change of physical and other conditions accompanying migration from the Low to the High Veldt, may be attended by a temporary lowering of physiological resistance, and a consequently increased liability to infection. The possibility, too, of “carriers” playing a part in the spread of the disease must be remembered.

Particulars as to the Seasonal Prevalence of Meningitis amongst the Coloured Population in 1906-9 are set out below for what they are worth :—

July ...	33	January ...	64
August ...	35	February ...	78
September ...	27	March ...	70
October ...	34	April ...	62
November ...	48	May ...	59
December ...	58	June ...	30

M.O.H. 1936-9
Meningitis.
Tuberculosis.

The serum treatment of this disease is probably the most hopeful. Dr. Williamson, the Medical Officer of Health for Edinburgh, in his last annual report stated that the mortality amongst cases in the Edinburgh City Hospital had been reduced from 78 per cent. to 46 per cent., which he attributes to the employment of Flexner & Jobling's serum.

TUBERCULOSIS.

Appended are the statistics for 3 years :—

DEATHS 1906-7-8-9.

TUBERCULOSIS.		WHITE.			S.A. COLOURED.			ASIATICS.		
		1906-7.	1907-8.	1908-9.	1906-7.	1907-8.	1908-9.	1906-7.	1907-8.	1908-9.
Of Meninges	...	1	1	1	1	6	—	—	—	—
Of Lungs...	...	88	81	84	322	303	383	16	12	12
Other forms	...	8	16	7	23	56	35	1	1	—
		97	98	92	346	365	418	17	13	12
		287			1,129			42		

DEATH RATE PER 1,000 PERSONS LIVING.

	WHITES.	S.A. COLOURED.	ASIATICS.	ENGLAND AND WALES.
1906-7 ...	1·01	4·39	2·50	1·15 in 1906.
1907-8 ...	1·02	4·63	1·91	1·11 in 1907.
1908-9 ...	0·94	4·81	2·18	—

A. AMONGST WHITES :—

During the two years 1907-8 1908-9, inquiry has been made in regard to each death from Tuberculosis, with a view to obtaining some idea as to—

- (a) the proportion of fatal cases which may be regarded as ‘imported,’ i.e., in which the infection was contracted before the deceased person came to South Africa ;
- (b) the proportion in which the disease was acquired during residence in South Africa, and
- (c) the effect of occupation.

During the period in question, 214 whites died from Tuberculosis. Of these, 144 were British-born, 24 hailed from other European countries, and 46 were Afrikanders, including 22 of English and 24 of Dutch descent.

The value of the results of our inquiries, as set out in the following tables, depends of course on the accuracy of the information recorded in the death certificate or subsequently furnished to your inspector.

DEATHS FROM TUBERCULOSIS OF OVERSEA IMMIGRANTS IN JOHANNESBURG.

1st July, 1907, to 30th June, 1909.

B = infected before arrival in South Africa. A = infected after arrival in South Africa.

		YEARS OF RESIDENCE IN SOUTH AFRICA.																		Total.	
		—1		—2		—3		—4		—5		—10		—15		—20		+20			
		B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A
British Born	...	8	1	8	2	5	1	4	2	5	4	12	19	13	28	9	12	4	7	68	76
Other Europeans	..	—	—	2	—	—	—	—	—	3	2	1	5	1	7	1	1	1	—	9	15
Totals	...	8	1	10	2	5	1	4	2	8	6	13	24	14	35	10	13	5	7	77	91

The proportion of fatal cases which may be regarded as 'imported' is as 77 : 214, M.O.H. 1906-9 or about 36 per cent. Tuberculosis.

The proportion in which the disease appears to have been contracted in South Africa is made up of deaths of immigrants infected after arrival, viz., 91, plus deaths of Afrikanders, viz., 46, and is therefore as 137 : 214, or about 64 per cent.

Details as to "Occupation" are as follow :—

Occupation.	Under 1 year.			—2	—3	—4	—5	—6	—7	—8	—9	—10	—11	—12	—15	—20	+ 20	All Ages.
	3ms	6ms	12m															
MINERS—																		
Machine Drillers	3	5	13	17	2	3	5	—	2	—	—	1	—	—	1	1	1	54
Oth'r Undergr'nd	2	1	6	5	1	3	1	—	1	—	—	—	—	—	1	1	1	23
Surface ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Engine Drivers and Fitters ...	1	—	—	3	1	1	1	—	1	—	2	—	—	—	1	—	—	11
Clerks & Salesmen	3	2	5	5	4	4	1	2	2	1	—	—	—	—	2	—	—	31
Housewives ...	3	1	1	3	2	1	3	2	—	—	—	—	—	—	1	1	1	19
Painters...	—	1	—	—	1	—	—	—	—	—	—	—	—	1	—	—	—	3
Carpenters ...	1	—	—	—	—	1	—	—	—	1	1	—	—	—	—	—	—	4
All others ...	12	3	13	17	8	3	4	1	1	2	—	3	1	—	—	—	1	69
Total ...	25	13	38	50	19	16	15	5	7	4	3	4	1	1	6	3	4	214

Seventy-seven deaths, or 35·7 per cent. of the total mortality from tuberculosis, occurred amongst miners employed underground, and in the majority of cases was no doubt associated by silicosis, fifty-four, or over two thirds, being those of machine-drillers. In 39·4 per cent. of cases death occurred during the first year of illness, and in another 28·9 per cent. before the end of the second year ; in five years 87 per cent. were dead.

These figures, however, do not represent the real extent of the ravages of this disease amongst miners, as it is well known that many of them return to Cornwall and elsewhere to die.

It is, further, clear that the registered deaths from tuberculosis amongst miners (77) and the percentage figure calculated thereon, must be increased by the addition of all tuberculosis deaths amongst repatriated miners, before the true percentage of such deaths amongst the mining and non-mining communities respectively can be ascertained.

Clerks and salesmen furnish the next largest number of deaths (31) from tuberculosis. It is not improbable that some of this class were men who, becoming incapacitated through mine work, were forced to take to lighter employment. More than 75 per cent. of this class died within five years of infection.

Housewives contributed nineteen deaths, and 68 per cent. of these sufferers succumbed before the end of the fifth year of illness.

B. AMONGST SOUTH AFRICAN COLOURED :—

Of the 1,129 deaths registered, 571 were those of persons from the East Coast (chiefly Portuguese 'boys') ; 55 from British Central Africa ; 98 from Transvaal ; 17 from Orange River Colony ; nine from Natal ; 108 from Cape Colony ; 12 from Rhodesia, and 47 Basutoland ; whilst 212 were classed as 'unknown.'

1,038 of the deceased persons were males and 91 females. The great majority were mine boys (690) and labourers (318), including house and stable boys. Practically all of these were between the ages of 15 and 40 years.

The duration of illness was as follows :—241 died in less than one month ; 122 under three months ; 229 under six months ; 181 under twelve months ; 48 under eighteen months ; 37 under two years ; 271 after illness of more than two years.

Attention is again directed to the steady increase of tuberculosis amongst natives, the 195 deaths of 1903-4 being followed by 219, 396, 346, 365 and 418 respectively in the five subsequent years.

M.O.H. 1906-9

Tuberculosis.

Heart Disease.

Cancer.

As stated elsewhere (v. p. 33), Dr. Geo. Turner has recently pointed out the very common infiltration of the lungs of tropical and sub-tropical natives to Bilharzia ova, often calcified, no doubt strongly predisposes such natives to this disease.

Dr. J. Borle, of Elim Hospital, Spelonken, Transvaal, wrote the M.O.H. (26/11/08) calling attention to the very fatal association of malaria and tuberculosis in the Spelonken district and the Low Veldt. Fortunately there is at present no malaria in Johannesburg.

ORGANIC DISEASES OF HEART AND ACUTE RHEUMATISM.

These heart affections include pericarditis, endocarditis, valvular disease and hypertrophy. The deaths recorded during the three years July 1st, 1906—June 30th, 1909, were 101, 112, and 112 for Whites and 54, 79 and 41 for South African Coloured. The figures for Whites are almost the same as those for 1905-6, but for S.A. Coloured show a decrease.

Of the white deaths, 234 were those of males and 91 those of females, indicating a considerably greater proportionate incidence on males. Fifty-four died under 15 years of age and 271 at later periods.

As heart disease is a frequent sequel of acute rheumatism, it is noteworthy that the death-rate per 1,000 for the last three years from the latter malady is 0·07 for whites, 0·16 for South African Coloured and 0·09 for Asiatics, as against 0·05 in England and Wales in 1907. These figures show a considerable decrease as compared with the period 1904-6, when they were for Whites and South African Coloured respectively 0·15 and 0·2 per 1,000.

In a paper read before the South African Medical Congress at Durban, in August, 1909, Dr. W. H. Rogers, of Johannesburg, pointed out that practically all observers consider rheumatism to be an infective disease, and though the conflicting results obtained by many bacteriologists have led to a just hesitation in accepting any one particular micro-organism as a causative agent, there seems to be a more or less general feeling that this will ultimately be found in one or several of the members of the streptococcal group. Rheumatism is not a notifiable disease, and most observations are therefore derived from the experience of individual practitioners; but, in Johannesburg at any rate, where the climatic conditions are fairly typical of the High Veldt, there seems to be a marked relationship between the state of the weather and the prevalence of rheumatic diseases. The subject, however, is one requiring further observation before any definite conclusions can be accepted.

MALIGNANT DISEASE OR CANCER.

Whites—

The deaths from cancer were 46, 52 and 49 respectively for the three years 1906-7 1907-8 and 1908-9. Of the total (147) 70 were males and 77 females, and 133 occurred at ages over 35. Stated in terms of the last census population, the mortality was 0·4 per 1,000 for males and 0·6 per 1,000 for females, as against 0·78 and 1·02 in England and Wales in 1907.

The English Registrar-General points out, however, that cancer-rates are most correctly estimated by comparing the total deaths at ages above 35 years with the number then living, but in the 1908 census these particulars were not obtained. A comparison on the basis of the figures of the previous census would be now erroneous, and consequently the method cannot at present be adopted.

In 19 cases the seat of the disease was not stated; in 37 the stomach was affected; in 22 the liver; in 18 the breast; in 15 the womb, etc.; in 9 the rectum; in 5 the face or jaw; in 4 each the pancreas, bones and kidneys; in 3 each the prostate and tongue; in 2 the spleen, and in 1 the larynx.

South African Coloured—

48 deaths were recorded, 12 being at ages under 35 and 36 at later periods. The parts affected are recorded as follows:—Liver 21, stomach 7, womb 5, throat 2, rectum 1, not stated 12. The death-rate per 1,000 living was 0·20, but it should be remembered that this population consists in Johannesburg mainly of young male adults who remain here a comparatively short time.

Asiatics—

Four deaths occurred, all of which were at ages above 35. The parts affected, as stated in each case, was the stomach.

In September, 1909, Dr. Maynard of Pretoria published an interesting paper entitled "A Statistical Study in Cancer Death Rates." His figures were based on the United States

Census of 1900, figures being taken only from those states and cities which adopted uniform registration laws. The following are Dr. Maynard's conclusions :—

M.O.H. 1906-9

Cancer.

Miners' Phthisis.

Syphilis.

1. The correlations found to exist between cancer, diabetes and insanity are not fortuitous, and due merely to errors of observation or record.
2. The statistics dealt with do not give any support to the suggestion that cancer is of infectious origin.
3. The explanation suggested to account for the facts as disclosed by statistical analysis is, that conditions of modern life, acting on physiologically unsound material may account for the correlations existing between these three diseases, as well as their increasing rates.

MINERS' PHTHISIS, ROCKDRILL PNEUMONIA OR SILICOSIS.

The deaths from this disease are recorded below :—

YEAR.	WHITES.	S.A. COLOURED.	YEAR.	WHITES.	S.A. COLOURED.
1903-4	36	3	1906-7	31	10
1904-5	44	6	1907-8	33	16
1905-6	39	15	1908-9	29	20

In 1908 a Government Commission, of which your Medical Officer of Health is a member, was appointed to report, amongst other matters, on the prevention of this disease. As the report in question will shortly be issued, further reference here is unnecessary, except to state that on the urgent recommendation of the Commission in November, 1908, additional regulations were gazetted requiring all mine managers to provide a sufficient supply of suitably clean water for use in connection with rock-drilling and 'lashing' in all places where such work is carried on, and making the use of such water by the miner compulsory.

SYPHILIS.

10 infant and 8 adult Europeans, and 17 infant and 84 adult natives, are registered as having died from this disease between July 1st, 1906, and June 30th, 1909.

Appended is a return kindly supplied by Dr. Mehliß, of the Johannesburg cases of syphilis and other venereal diseases treated at the Lazaretto during the years 1906-9 :—

Years.	Whites.	Coloured.
1906-7	257	332
1907-8	185	324
1908-9	179	323

With regard to the drop in the number of white cases admitted in 1907-8 it must be borne in mind that on the 1st July, 1907, the Rand Provisional Hospital Committee which previously administered Rietfontein ceased to exist, and the regulations governing the admission of white venereal patients were made more stringent.

Syphilis is a disease of considerable importance in South Africa, many native customs tending to spread the disease broadcast. In certain districts in Uganda—where it threatens to decimate the inhabitants, being the chief cause of the heavy infantile mortality—its incidence has been placed as high as 90 per cent.

In 1906 a Commission was appointed by the Transvaal Government :—

- (a) To consider and report to what extent contagious diseases were prevalent amongst the native population in the Transvaal; and
- (b) To submit a definite scheme for the treatment of such diseases, suitable to the conditions of life of the said population.

The Commission, of whom your M.O.H. was one, presented their report in 1907. Appended is the summary of the recommendations and conclusions :—

1. That soft chancres and gonorrhoea undoubtedly exist to a very large extent amongst the natives of the Transvaal, and are respectively known as "jovela" and "morotwana."

2. That syphilis appears to have been introduced somewhere about 1881, probably from Kimberley, and has since become widely prevalent, its present incidence varying from "very little" to "over 80 per cent. in some parts of the Zoutpansberg"; that it is known to the natives as "thusula," "dirata," and

M.O.H. 1906-9 "dekengkeng"; and that where it is seriously prevalent and unchecked, it is presumably increasing amongst those unprotected by heredity.

Syphilis.

3. That the incidence of syphilis amongst any class of natives working on the Witwatersrand mines is very slight; but that there is a great deal of it amongst togt boys and others living in municipal locations and employed in the towns, and in the families of these natives.

4. That in the Pretoria and Western Districts and the Waterberg and Lydenburg Districts syphilis is very common. In the west and south-west parts of the Zoutpansberg it is very seriously prevalent amongst the Basuto-speaking tribes and Ndebele, the syphilitic zone taking the course of the Sand and Dwaars River down to the Woodbush Range, then south following the Woodbush to a point somewhere opposite Haenertsburg, and thence across the mountain to Olifants River near Dwaars River.

5. That the Shangaans and Bavendas are comparatively free from syphilis.

6. That syphilis is "enormously prevalent" in the adjacent parts of Bechuanaland.

7. That the recognition of primary syphilis is comparatively rare, owing to the peculiar slightness of the symptoms and the natives' consequent disinclination to seek advice; that the disease is almost always in the late secondary or tertiary stage when it comes under notice, and that the amount of hereditary or congenital syphilis is very large.

8. That "indirect" or "mediate" infection, *e.g.*, by community of use of utensils, frequently occurs, though we are not prepared to say that it is more frequent than "direct" or "immediate" infection.

9. That syphilis is believed to have been conveyed by the use of infected knives in the circumcision rite, and by the practice which is alleged to exist in some places of inoculating the parents with each other's blood when a birth has taken place.

10. That the majority of natives do not associate syphilis with the consequences of impure sexual connection; that they greatly fear the disease and, in some tribes, isolate infected persons, and that they desire, and are often prepared to pay for, medical treatment.

11. That in numerous instances white children have been infected through being kissed by syphilitic native nurses, and that in this and other ways the prevalence of syphilis amongst natives is a serious menace to the population of the Transvaal, irrespective of colour.

With regard to Prevention and Treatment.

12. That Professor Metchnikoff's method of preventive mercurial inunction cannot be usefully or safely entrusted to natives.

13. (a) That the Labour Districts, as centres of infection, should be dealt with by measures based on a special Contagious Diseases Act similar to that of Cape Colony, with the amendments suggested by experience.

(b) That for the successful working of this proposed Ordinance, accommodation should be provided for infected persons, and that for the present we recommend one large institution near Johannesburg rather than several smaller Lock Hospitals.

(c) That all natives be examined at the Pass Offices for evidences of syphilis, as is now done in regard to vaccination, and that the public be advised to have coloured nurses medically examined before entrusting their children to them, and periodically afterwards.

14. (a) That in country districts, stations such as the very excellent institutions at Elim and Blaauwberg offer the most promising solution of the difficulty; that increased assistance should be afforded to the existing stations; that a Government farm be provided for an institution to replace that which has now to be removed from Blaauwberg; and that additional stations be established experimentally near Warmbaths and at Mpahlela's, with others later on, if and where desirable.

(b) That District Surgeons be provided with potassium iodide for free distribution; that they be paid a monthly sum for the treatment of all syphilitics who are certified paupers; that dispensaries be established, at which the District Surgeon shall attend periodically, and depôts where anti-syphilitic medicines can be obtained; that, where practicable, the District Surgeon make periodical tours to discover and treat syphilitics; and that headmen be paid, say, 1s. 6d. for each fresh case and 3d. for each old case brought up monthly for treatment by the District Surgeon.

(c) That, except in the case of certified paupers, each patient should, where possible, be required to pay, say, 10s. to 20s. for the entire treatment of his case.

15. That steps be taken for the dissemination of information in a popular form regarding this disease.

On the 15th April, 1909, the Colonial Secretary issued Circular No. 4 entitled, "*Special Anti-Syphilitic Measures*," to all resident magistrates and district surgeons, requesting them to exert unremitting attention and care in the discovery and successful treatment of the greatest possible number of cases of syphilis amongst natives. It further stated that medicines will be supplied for free issue to syphilitics by district surgeons in all cases, with the exception of certain remote districts where no district surgeon is easily available and where medicines will therefore be supplied for issue to natives by native sub-commissioners with instructions for their use. Magistrates are directed to cause information to be thoroughly disseminated throughout their districts, especially amongst the natives, that the district surgeon will treat without charge all cases of syphilis which present themselves to him for treatment, this arrangement applying to indigent whites as well. Magistrates are also to arrange for district surgeons to visit native locations, stads and kraals for the purpose of medically inspecting the residents and detecting cases of syphilis.

In connection herewith, the M.O.H. has recently received from the M.O.H., Transvaal, copy of a further Circular No. 1 3/18524 of 15th January, 1910, addressed by the Colonial Secretary to all magistrates, sub-native commissioners, pass-officers, district surgeons and vaccination medical officers in labour districts and urban areas. In this document, the Colonial

Secretary intimates his desire that the Special Anti-syphilitic Measures taken during 1909 be continued during 1910, and supplemented, so far as natives are concerned, by the introduction of a regular system providing for the detection of syphilis in natives upon their initial registration at pass offices, and by correlating a system of treatment by district surgeons with an organised method of securing treatment for special cases at the Rietfontein Lazaretto, Johannesburg.

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Syphilis.

Smallpox.

The system which the Colonial Secretary desires to establish in 1910 may be considered under the following heads :

“(I) Detection of the Disease.

“(a) In connection with the pass system ;

“(b) By district surgeons making special tours of examination.”

“(II) Treatment of the Disease.

“(a) By a course of treatment at special institutions ;

“(b) By issuing medicines for application at home.”

The following is the official explanation of the application of the extended system to the Rand :—

“ Central Labour District of Johannesburg.”

“(1) The medical Officer at the Chief Pass Office, Market Street, Johannesburg, will examine all natives submitted to him by the Chief Pass Officer, primarily for vaccination, but also with special regard to the detection of syphilis. Any case of syphilis which he discovers will be notified by him to the Pass Officer on a prescribed form (Annexure 2). For every certificate thus delivered by him to the Pass Officer, the medical officer will be paid 2s. 6d.

“(2) Any private employer of a native (male or female) who suspects that such native has syphilis, may take him or her to the Police Surgery, Von Brandis Square, for free examination by the district surgeon at 10 o'clock in the morning of any weekday.* If the district surgeon finds that the native is syphilitic he will certify to that effect on a prescribed form (Annexure 2) to the Chief Pass Officer, Central Pass Office, and will deliver the native and the certificate to the police orderly. The orderly will cause the native and the certificate to be delivered to the Chief Pass Officer at the Central Pass Office. For every certificate signed by him the district surgeon will be paid the sum of 2s. 6d.

“(3) Any police officer who has reason to suppose that a native (male or female) is affected with syphilis will cause such native to be taken to the district surgeon at the Police Surgery, Von Brandis Square, at 10 o'clock in the morning of any weekday.* The disposal of such native, if found to be syphilitic, will be as under (2) above.

“(4) The compound manager of any mine who is informed by the mine doctor of the existence of a syphilitic mine native domiciled in the Transvaal, may have such native treated free by Government, provided that he obtains from the mine doctor a certificate on a prescribed form (Annexure 2), and provided that he releases the native from his contract of service and delivers him, with the certificate, to the Chief Pass Officer, Central Pass Office.

“For every certificate thus signed by him the mine doctor will be paid 2s. 6d.

“(5) The Chief Pass Officer at the Central Pass Office having received natives and certificates from the Public Vaccinator, the police, or mine managers, will detain the natives in the Compound Isolation Hospital, until such time as they can be sent to Rietfontein Lazaretto by wagon or on foot, in charge of a native constable, if they are able so to travel. The Chief Pass Officer will post all notification certificates received by him on the day of their receipt to the Assistant Colonial Secretary, Pretoria.

“(6) On the request of the Chief Pass Officer, the Medical Superintendent, Rietfontein Lazaretto, will supply transport for removal of syphilitics from the Pass Office to the Lazaretto.”

* No male native can be compelled to submit to medical examination for the purpose of detecting syphilis, except in Urban Areas to which the Urban Areas Pass Regulations apply, nor can a female native be compelled to undergo medical examination in any area or district.

SMALLPOX AND VACCINATION.

Only three cases of this disease came to light during the period under review. Two were imported, the third being a ‘contact.’ There was one death. The circumstances are briefly as follow :—

On December 1st, 1906, a batch of 22 natives arrived in Johannesburg from Butterworth, Cape Colony. One of the natives—an unvaccinated boy named “Stick”—who was unwell, was taken to 22, High Road, Fordsburg. He was seen the following morning by the District

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Smallpox. Surgeon, who diagnosed the case as smallpox, and the native was accordingly removed to the Lazaretto. The premises were at once visited and the usual measures of disinfection, vaccination and observation of contacts, etc., carried out. No further cases resulted.

Puerperal Septicaemia.

Scarlet Fever.

The second introduction of the disease was in March, 1908. An unvaccinated native named Mannel, who had left Ressano Garcia for Johannesburg on March 20th, was removed from the Nonrse Mines to the Lazaretto on March 30th, where he died from confluent smallpox on April 7th.

The third case was a contact with the above, and was removed to Rietfontein on April 14th. No further spread of the disease occurred.

That neither of the above cases was followed by an outbreak is a matter for congratulation.

The routine measures adopted by the Department for dealing with such cases will no doubt prevent any extensive spread of the disease, provided notification is early and contacts are readily traced. On the other hand, if notification is delayed or contacts from some reason or other cannot be readily traced and dealt with, the factors are present for an outbreak, especially in a community where vaccination and revaccination are not compulsory for whites. The natives, however, are fairly well protected, as vaccination is compulsory at the Pass Offices. Up to the present the Government have not seen their way to making vaccination and revaccination compulsory. Under Law 12 of 1895, and Section 58 of Ordinance of 1903, general compulsory vaccination can be carried out, but *in times of emergency only*. It is then too late to prevent an epidemic; but if the community will not allow themselves to be protected against smallpox by compulsory vaccination, they must be prepared to foot the bill when an outbreak occurs.

PUERPERAL SEPTICAEMIA, ETC.

	1906-7.		1907-8.		1908-9.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
WHITES	4	4 (Including 1 outside)	16	11 (Including 1 outside)	13	8 (Including 1 outside)
SOUTH AFRICAN COLOURED ...	3	1	2	1	1	2 (Including 1 outside)
ASIATICS	—	1	—	—	—	—

Of the 39 cases inquired into, 26 received no medical attention during their confinement, 12 being attended by nurses or midwives and 14 by friends. There was no evidence that any practitioner or midwife conveyed the infection from one patient to another. In all notified cases the hands of midwives or other female attendants were as far as possible disinfected in the presence of the Inspector. Clothing and other possibly contaminated articles were also disinfected, and the person in question required to bathe.

The death rate from puerperal febrile conditions per 1,000 white persons living was 0.051 in England and Wales in 1907. In Johannesburg in 1906-9 it was 0.070. The explanation is not clear, though the fact that the birth rate in Johannesburg was 36.0 against 27.0 in England and Wales in 1907 should obviously be borne in mind.

SCARLET FEVER,

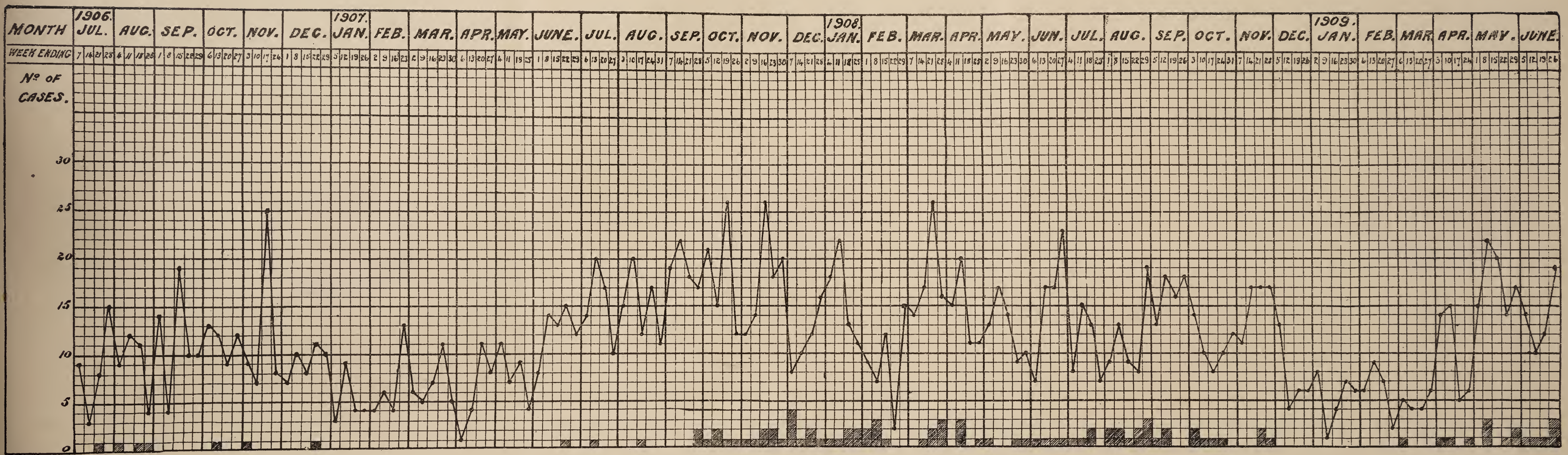
	1906-7.		1907-8.		1908-9.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
WHITES	471	8	795	54	564	43
SOUTH AFRICAN COLOURED ...	17	—	10	—	3	1
ASIATICS	—	—	2	—	—	1

Up to the middle of 1906, scarlet fever was a fairly mild disease in Johannesburg, the mortality being only 0.04 per 1,000 as against 0.11 in England. Since then this malady has become not only more widely prevalent but also more virulent in character, the mortality being 0.36 per 1,000 persons living as against 0.092 in England. General experience elsewhere has shown that the disease is more or less continually prevalent in all large towns, but that

Scarlet Fever Chart.

(Whites).

JULY 1906 - JUNE 1909.



Black Curve = White Cases.

■ = Deaths.



once in every five or six years it becomes widely epidemic. Statistics over a number of years M.O.H. 1906-9
 are not available for Johannesburg, but the incidence of the disease has been increasing up to Scarlet Fever.
 1907-8, when it is hoped that the crest of the curve was reached, as signs are not wanting that the disease is now on the decrease (see chart opposite). One of the chief factors in its spread, judging from those cases which came to light in the desquamating stage, has been the number of mild and unrecognised attacks. Handbills setting forth the symptoms of the disease and precautions to be adopted were accordingly circulated throughout the infected districts, and the Principals of Schools within the Municipality have rendered most valuable assistance in response to the request of your M.O.H. by arranging for the children attending school to be examined daily for peeling of the skin or other symptoms. It would not appear, however, that school attendance has played an important part in the spread of the disease. No outbreak occurred which could be in any way ascribed to the milk supply. It is possible that isolated cases may have had milk as their source of infection, but such cases could not be distinguished from others. As Dr. Robertson* (M.O.H., Birmingham) points out: "Our knowledge as to how scarlet fever is spread in large cities is distinctly unsatisfactory. Recently it has been suggested that there may be 'carriers' of scarlet fever in a similar manner as of diphtheria and enteric; but while there are many facts in support of this theory, actual proof is lacking until such time as the causative agent of the disease is discovered."

Hospital isolation on a large scale has not been practised; in fact, only a little over 8 per cent. of all cases have been so treated. The accommodation at Rietfontein is not unlimited, and the expense is enormous, each patient so isolated costing the community 10s. 6d. per day. Unless, therefore, satisfactory assurances are forthcoming that repayments will be made, only those patients are removed who would otherwise be a serious danger to the public health. European experience has shown that isolation of scarlet fever entails an expense which in the opinion of many has hitherto been out of proportion to the preventive results obtained. While no doubt it is of great benefit from the point of view of convenience to the general public, it does not play the part which was expected in the prevention of the disease. During 1907 some 90 per cent. of the notified cases of Scarlet Fever in Birmingham† were isolated in the City Hospital; but, notwithstanding this, the disease increased and was more prevalent than during the preceding year. With a view, therefore, to ascertaining what effect hospital isolation had on the occurrence of secondary cases in infected houses, Dr. Robertson (v. page 32, Annual Report 1908), instituted an inquiry as to the incidence of Scarlet Fever in houses from which the first case was removed and also as regards houses in which the first patient was nursed at home. From the figures of the past five years (1904-1908), which are now available, it would appear that in 83.9 per cent. of the houses from which the first case was removed to hospital no secondary case followed, while, in the case of those patients nursed at home no secondary case followed in 89.6 per cent. of the houses. Dr. Robertson points out that the latter group contains many of the larger houses as well as many of the smaller families, and in this respect they are at a greater advantage over the former. On the other hand, the entire removal of the infection at an early period should be a counterbalancing advantage to the first group of houses.

An inquiry on similar lines is being started in Johannesburg and attention will be directed to this point in future reports.

It not unfrequently happens that a patient who has suffered from Scarlet Fever and who has been treated in a Fever Hospital, is discharged as being presumably free from infection, and yet, after his return home, apparently infects other members of the same household. Any individual so infected within a more or less arbitrary time is spoken of as a 'Return' case. Only one 'Return' case came to notice during the period under review, but this no doubt is chiefly due to the small percentage isolated. In this connection, it is interesting to note the experience of other cities. From the table by Dr. Moore, published in June, 1908, in "Public Health," it would appear that the percentage of 'Return' cases varied from 12.4 in Lewisham to 1.2 in Manchester. The figures for the Metropolitan Asylum's Board in 1903 was 3.09, but in this latter case the arbitrary time is fixed at 3 months.

To lessen this risk as far as possible, the following printed instructions are now handed to the patient or his parents on his leaving hospital;—

- I. The child should not be allowed to return to school or to mix freely with other children immediately after leaving hospital. If possible, he should be sent away for a time, e.g., a fortnight, to a house where there are no children.
- II. If this cannot be done, the child should not be permitted to sleep with or kiss other children.
- III. Should a discharge from the nose or ears occur after the patient has returned from hospital, he should be isolated, and advice obtained from the family doctor.
- IV. Great care should be taken to avoid cold after convalescence. Warm clothing should be provided and flannel worn next to the skin.

In a recent report (September, 1909), to the London County Council, Dr. M. H. Gordon draws attention to an "observation which may have valuable application in future outbreaks of

* Annual Report by M.O.H. for City of Birmingham (Dr. Robertson) on Health of City of Birmingham for 1908.

† See Report M.O.H., Birmingham, 1907.

M.O.H. 1906-9 “scarlet fever in which infection of the milk by human agency is apparently excluded, and the
Scarlet Fever. “cow itself is under suspicion as the source of infection.” He says :—
Diphtheria. “The discovery of Bordet and Gengou, of the Pasteur Institute, of the “Fixation of
Erysipelas. “Complement” method has provided us with a specific test whereby we can recognise the
Measles. “presence of specific anti-bodies in the blood of an animal affected by a given infection.

“Schleissner, of Pragne, in a recent paper entitled “Bacteriological and Serological Studies
“in Scarlet Fever” (Wien. Klin. Woch., xxii. 16, 1909, p. 553), has applied this test of fixation
“of complement to the serum of persons suffering from scarlet fever, with the result that he finds
“that by this test the serum of scarlatina patients can be shown to contain a specific anti-body
“for the scarlatinal streptococcus, from the second up to the sixth week of this disease. Control
“experiments made in the same way with serum from normal persons, and from persons suffering
“from diseases other than scarlet fever, were negative in this sense.

“In future outbreaks of milk scarlatina, therefore, by applying this test to the serum of
“cows under suspicion of having originated the outbreak, it should be possible to decide whether
“their blood contains the same specific anti-body than is found present in the blood of persons
“suffering from scarlet fever between the second and sixth week of the attack. The information
“thus obtained may be found to furnish a valuable piece of evidence in elucidating the causation
“of such outbreaks.”

DIPHThERITIC DISEASE INCLUDING MEMBRANOUS CROUP.

	1906-7		1907-8		1908-9	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Whites	18	11	31	14	46	18
South African Coloured ...	3	4	3	2	2	—
Asiatics	—	—	—	—	—	—

The mortality per 1,000 living was 0·15 for the three years against 0·16 in the 76 great towns of England in 1907.
Careful inquiry in each case revealed no community of school attendance, milk supply nor other special circumstance.
The diagnosis of diphtheria was bacterially confirmed in 29 cases, 11 reports being negative. 212 phials of anti-diphtheritic serum were distributed.

ERYSIPELAS.

	1906-7		1907-8		1908-9	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Whites	47	4	55	1	35	3
South African Coloured ...	21	1	30	2	34	6
Asiatics	16	1	6	—	6	—

There has been a marked decrease in both the number of cases notified and the deaths from erysipelas during the period under review. The figures for whites represent a mortality of 0·02 per 1,000 against 0·03 in England and Wales in 1907 and 0·1 in Johannesburg during 1904-6. The reasons for this decrease are not clear, but there is little doubt that the dust nuisance in Johannesburg has been less than in former years, largely due to the extension of macadamised roads and the tarring of the principal thoroughfares. As in former years, however, the majority of cases were facial, and 64·2 per cent. of the white cases were not associated with any visible wound.

MEASLES.

In 1906-7, 1907-8 and 1908-9 the mortality was as follows :—Whites, 61 ; S.A.C., 49 ; Asiatics, 2. For both Whites and S.A.C. the death-rate per 1,000 persons living was 0·2 as against 0·361 in England and Wales in 1907.
During 1908 there was a more or less general outbreak of the disease necessitating the closure for varying periods of the following schools :—Norwood ; Booyens ; Lilian Road,

Fordsburg ; Crown Reef ; Von Brandis Square ; Henri Street, Braamfontein ; the Preparatory Department of the Jeppes High School, and two divisions of the Fairview Junior School. M.O.H. 1906-9
Measles.

The procedure recommended by the Local Government Board in regard to school closure on account of measles, was adopted as far as possible, viz., the closure of the suspected class on the ninth day after the sickening with the disease of the first child, for a period of five days only. After this time only those children who had sickened with the disease were excluded, together with those in the same households who had not had measles. Plague.

In Infant Schools *all* children from infected households are excluded. Intimation, however, in most cases was not received early enough to allow of this procedure being followed.

In addition to school-closure, handbills were drawn up and circulated (see p. 58), drawing attention to the prevalence of the disease in the town and setting out the precautions to be adopted.

These measures were apparently to some extent successful. Measles at the present time is comparatively negligible as a cause of mortality.

PLAGUE.

No case of Plague has occurred during the period under review. Early in November, 1908, however, an intimation was received from Dr. Gilchrist that he was attending an Indian in the Malay Location whom he suspected might be suffering from pneumonic plague. The case was visited by the acting M.O.H. with Dr. Gilchrist, and specimens of the man's sputum were collected and at once taken to the Government Laboratory where they were examined by the Government Bacteriologist, who reported that as far as plague was concerned, the specimens were negative. The Acting M.O.H. agreed with this diagnosis, which was confirmed by the patient completely recovering.

A circular, letter, however, was again addressed to the Medical Practitioners in the Town drawing attention to the possibility of Plague first appearing in the pneumonic form—more especially amongst the Asiatic population—and asking that the sputa of all cases of pneumonia which were in any way suspicious of Plague should be submitted to the Government Bacteriologist for examination.

The necessity of holding a post-mortem examination in any suspicious case of pneumonia terminating fatally was also insisted on.

ROUTINE PLAGUE PREVENTIVE MEASURES.

These included:—

1. Bacterial examination of sputa of pneumonia patients.—1,266 specimens were examined—all being negative ; and
2. Rat destruction and examination.

The procedure followed has been similar to that in former years (see Report 1904-6), but early in 1907 the number of ratcatchers was reduced to one. Neither poison nor any of the various bacterial preparations are used, reliance being placed on traps, dogs and ferrets. The total number of rats and mice destroyed was 43,098, of which 9,398 were examined at the Government Laboratories, all being reported as free from plague.

Plague is now generally recognised as essentially a rat disease which is not infrequently communicated to man. The Indian Plague Commission has proved that rats are the chief source from which man acquires plague, and has afforded the strongest possible grounds for inferring that man becomes infected through the agency of rat fleas. There are many kinds of fleas,* some being more particular than others in the selection of their host. *Pulex irritans*, which is the human flea, is seldom found on any other animal than man. *Ceratophyllus faciatus*, the common flea found on rats in Europe, is more or less particular in its choice, being found generally on rats. *Pulex cheopis*, the Indian rat flea, unlike *ceratophyllus faciatus*, readily feeds on a number of animals. In the absence of rats it will bite man, especially when it has been starved for two or three days.

While no doubt several kinds of fleas may convey plague, *Pulex cheopis*, on account of its habits, is probably the commonest agent. In this connection it is interesting to note that 70 per cent. of the fleas from Johannesburg rats—which were kindly examined in 1907 by Major Lamb I.M.S., Senior Member of the Indian Plague Research Commission, were reported as being *Pulex cheopis*. Under these circumstances the importance of keeping a close watch on the rats in the town will be readily understood.

Large, however, as the number (43,098) destroyed is, it is not suggested that it even touched the fringe of the rat-population. No doubt certain blocks and premises were temporarily

*See the Cause and Prevention of the Spread of Plague in India, by Capt. Glen Liston, I.M.S.

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sis.

freed of these vermin, but the ratcatchers have chiefly been of use as an Intelligence Department. Some 10 rats from different parts of the town are now daily examined at the Government Laboratories, and by these measures and the co-operation of the district sanitary inspectors early information should be received of any unusual rat mortality.

MALARIA.

Appended are the statistics of the disease :—

					1906-7		1907-8		1908-9.	
					Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
WHITES	...	...	...	...	141	3	71	3	10	8
SOUTH AFRICAN COLOURED					238	34	439	12	117	11
ASIATICS	...	..	...	...	38	2	10	1	3	—

In connection with the above Table, it must be remembered that malaria ceased to be a notifiable disease in October, 1908.

All the above cases were those of persons who had contracted the disease elsewhere, the majority of the coloured cases being East Coast natives.

ANKYLOSTOMIASIS.

This is a disease which specially affects agricultural labourers in tropical or semi-tropical countries, miners, tunnel-piercers, etc.

It is caused by a trematode worm roughly one-third of an inch in length, with a powerfully armed mouth, the margin of which is furnished with four strong claw-like hooks and two conical teeth. The worm attaches itself by these hooks to the mucous membrane of the intestine (*duodenum and ileum*), large prolongations of which it sucks down into its oesophagus. This portion of the mucous membrane is destroyed. It is supposed to shift its hold from time to time, the abandoned bite continuing to ooze blood for a short period. It is doubtful whether the worm is a true blood-sucker, for, according to Loos, the main food of the parasite is the cells comprising the mucous layer of the intestine. It is generally accepted, also, that the worms inject a poison into the system, conjectured by some to be of a hæmolytic nature. The number of worms in the intestine varies. In the celebrated outbreak at the St. Gothard Tunnel as many as 3,000 were found. The number introduced by one infection, however, does not increase unless the sufferer reinfects himself.

The life-history of this worm is very important from the point of view of prevention of the disease. It is briefly as follows :—The female worm attached to the lining membrane of the bowel of its host (man), produces ‘a prodigious and never-ending stream of eggs,’ which are passed out in the human fæces. If these eggs find a suitable soil, they hatch out into larvæ, which grow rapidly for a week, moult twice, and then pass into a torpid condition, ceasing to eat and grow (Manson). In this state the larvæ may continue for months in muddy water or damp earth, or moist mine timbering. If the skin of a miner is brought in contact with this mud or timber, they will burrow into the flesh, causing sores (known in Cornwall as bunches), and eventually finding their way into their victims’ digestive canal, give rise to the symptoms already described. The infection may also take place through the mouth, *e.g.*, by mud conveyed by the fingers or a foul pipe-stem. Most observers believe that the larvæ cannot become sexually mature or reproduce outside the body, but Dr. Ozzard (P.M.O. British Guiana)* states that the embryos develop into free, sexually mature worms in from 8 to 10 days, and that for months he obtained specimens at all stages of growth.

The symptoms are those of dyspeptic trouble, associated with progressive and marked anæmia. Manson states that one of the earliest indications is pain or uneasiness in the pit of the stomach, which is often increased by pressure, but may, for the time, be relieved by food. The appetite is often ravenous, but its gratification may give rise to marked digestive trouble.† After a time the skin and mucous surface become pallid, the face puffy, the feet and ankles swollen, and other symptoms of anæmia increasingly obvious, though in many cases there is not much waste apparent. The proportion of red cells in the blood decreases very greatly. Usually, however, the disease is very chronic, and many recent observers are of opinion that unless the worms are present in large numbers they have little or no direct ill-effect. The condition, however, predisposes its victims to other maladies, *e.g.*, tuberculosis and pneumonia, and reduces their chance of recovery.

* British Medical Journal, Sept. 18, 1909.
† These early symptoms are very like those of duodenal ulcer.—C.P.

It is also stated to attack mine-timbers, rendering them unsafe. Almost every barefooted person in tropical districts is said to harbour this infection.

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Ankylostomiasis.

Dr. G. A. Turner states that ankylostomiasis is exceedingly prevalent among many of the freshly recruited native labourers, especially those from the East Coast, and from the central tropical areas of South Africa. The following is a conservative estimate of the percentages arriving infected :—Shangaan, 60 per cent. ; Mchopis, 30 per cent. ; Nyambaans, 30 per cent. ; Mozambique, 70 per cent. ; Quilimanes, 70 per cent. ; Nyassa boys, 70 per cent. ; B.C. African, 20 per cent. A certain percentage of recruits from Zululand are also infected, but he has not found the disease amongst native arrivals from Cape Colony, British Basutoland and German West Africa. Dr. Haydon has detected the disease amongst Indian Coolies in Natal and also amongst Northern Chinese who had just been taken off the transports. Both white and native workers in the De Beers Mines at Kimberley have long been infected.

It is remarkable, however, that except on one property to be subsequently referred to, the disease has not caused trouble amongst the European miners, and the natives have not re-infected themselves (as they might have been expected to do) to such an extent that any larger number of them are incapacitated for work. Having regard to the enormous amount of infection pouring in, we can only conclude that the eggs of this worm when passed by the infected natives do not develop into larvæ in the mine workings ; or, if they are formed, that they are quickly killed or rendered harmless.

Now Dr. Boycott, in his 1904 Report to the Home Secretary on the Diagnosis of Ankylostomiasis Infection, points out that nothing like ankylostomiasis could be found in the Levant Mine (Cornwall), a mine which seemed to be most favourably situated for its introduction and spread. The explanation of this immunity he found to lie in the salinity of the mine water, which varied from 0·94 per cent. to 3·0 per cent., whereas a 2·5 per cent. solution of salt quickly kills the young larvæ. Similar experience has been recorded in certain Polish and French mines, and accordingly it has been recommended that dusty mines should be sprayed with a 2 per cent. salt solution, and wet mines have salt scattered through them as a prophylactic.

In view of the fact that the Rand mine waters are acid, presumably as the result of oxidation of sulphides in the pyrites over which the mine waters flow, it occurred to Dr. G. A. Turner that this acidity might have on the Rand a similar beneficial effect to that of the salinity of the Levant Mine water in Cornwall. He has accordingly had estimations of acidity made in respect of the waters of several series of outcrop and of deep mines. The results vary from as much as 43·3 per cent. acidity in terms of H_2SO_4 to 0·7 alkalinity, and demonstrate that in mines where the reef has been exposed for some time the water is acid, that the degree of acidity varies considerably in different parts of the same mine, that in deep levels with only a limited amount of reef exposed the waters as a whole are only faintly acid, and may be uniformly alkaline. At Dr. Turner's request, experimental investigation was then made by the late Government Bacteriologist for the Transvaal (Dr. W. Aylmer May) who found "that 0·07 per cent. sol. H_2SO_4 rendered the larvæ sluggish after six days' exposure ; a 0·1 per cent. solution killed them in the same time, and in solutions of from 0·25 per cent. to 1·0 per cent. no larvæ were hatched out at all.

These various facts appear to justify the conclusion that in mines with water having an acid reaction, a natural process of disinfection against ankylostomiasis is constantly going on, and there is very little risk of the disease spreading.

Further, the ova of the parasite cannot develop without a certain amount of moisture, nor below a temperature of 77 deg. F. Now, some of our mines are very deep, and in parts of many the temperature does not reach the figure named, and on this account such mines are safeguarded from infection, even when the acidity of the mine water is very low.

As already intimated, the infected natives have spread the disease to whites on one deep level mine in which are present the three factors essential for the development of the parasite, viz., an alkalinity of the mine water less than 2·5 per cent. solution of salt, a wetness sufficient to render the inclines very muddy, and an average temperature above 70 deg. F.

As regards the prevention of the disease in this and similar mines, Dr. Turner points out that with the class of raw native labour at present employed, the mine workings will, in spite of all precautions, continue to undergo considerable faecal contamination, and thereby to become infected, unless all infected persons are prevented from going below ground, as is done in the Westphalian mines. Dr. Turner, however, regards such exclusion as impracticable in the Transvaal on account of the probable resentment of both white and coloured labourers and of the expense involved. The number of mines, however, in regard to which such exclusion would be necessary is apparently small, and the M.O.H. is not entirely satisfied that in such cases this measure would be unworkable.

The second alternative is that of disinfecting with sodium chloride equal to a 2·5 per cent. solution and might be possible on a very small scale ; but it would be quite impracticable in mines into which infection is being poured daily, and even hourly. Attempts in this

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sis,
Bilharziosis.

direction have been unsuccessful in Westphalia and elsewhere. Dr. Turner suggests, however, that an attempt, if only as an experiment, should be made to spray the mine-timbering on which the larvæ are particularly prone to collect; and Dr. Stock suggests that new timbering should be soaked in brine solution before being fixed in position.

With experience of the disease in Kimberley and on these Fields, Dr. Turner concludes that "all we can do is to recognise that certain mines are infected; and after warning the men "working there to take precautions in the way of wearing boots, washing their hands before "eating, etc., and at the same time maintaining as careful sanitary arrangements as possible, "little can be done beyond treating the miners when they commence to show symptoms of "anaemia or other signs of the disease."

It would also appear desirable to distribute in handbill form amongst white miners, or to hang up in public rooms, some simple information as to the causes and prevention of this disease.

Such a handbill as suggested is in course of preparation.

The disease was made notifiable on the 5th August, 1904, by Proclamation 43 of 1904, but was removed from the list of notifiable diseases in September, 1908. During the period 1906-9, 15 cases were reported, namely, 5 Whites, 9 S.A. Coloured, and 1 Asiatic.

BILHARZIOSIS.

This is a disease of which the commonest symptom is hæmaturia or bloody urine. It is caused by a white cylindrical bi-sexual Trematode worm 15 to 20 mm long and 1 mm thick. Its ova are of two varieties, viz., 'terminal-spined' and 'lateral-spined.' This worm was first described by Billharz in 1851 and is named *Bilharzia Hæmatobia*. Manson stated that, with the exception of Mesopotamia, and perhaps Arabia, its habitat is limited to Africa and its island dependencies. Egypt is its favourite haunt; there it is present in quite half of the population (Manson), and it was recently recognised in the tissues of an Egyptian mummy of the Twentieth Dynasty, and therefore over 3,000 years old.† It is found in river waters from Egypt to Cape Colony, but prior to the publication of the Cragg Research Scholarship Thesis, 1909, by Dr. G. A. Turner, little has been heard of this malady amongst natives working on the Transvaal mines.

Dr. Turner, however, states that there is probably no disease which causes the inhabitants of the province of Mozambique so much distress and anxiety as Bilharziosis, to which "every evil under the sun is attributed." As the result of 971 autopsies on natives from all parts of South Africa, he found that at least 80 per cent. were infected. Curiously enough the disease appears to be unknown amongst Basutos and natives of Damaraland.

There is no doubt that it is contracted in some way from bathing in rivers containing the parasite, but there appears to be some ground for the popular belief that this indictment does not apply to streams running westwards. In the Cape Colony there was formerly a very general belief that the organism in some form crept up the urethra of bathers. Now it is believed that it is either swallowed with the river water, or that, in the same way as the ova of hookworms in the mud or timbering of mines penetrates the skin of miners, it enters through the skin of bathers or waders in infected water or mud. Dr. Turner favours the latter view, because of the fact that in infected districts, where both males and females drink the same water, the boys, who all bathe, are attacked almost without exception, while the girls, none of whom bathe, are hardly ever known to suffer.

The period of incubation, judging from the known circumstances of infection at Pretoria of a batch of freshly arrived soldiers, is from one to two months.* The appearance of symptoms may be accelerated and their severity increased by violent exercise, *e.g.*, rough riding.

The symptoms may be divided into (a) urinary, (b) intestinal, and (c) pulmonary.

As regards the natives of Cape Colony, Natal, and the Transvaal, the manifestations are rarely other than urinary. But amongst natives from tropical and sub-tropical East Africa, all three groups of symptoms present themselves, and, as already stated, there is probably no disease which causes so much distress. This marked geographical difference in the severity of the malady has suggested the view that there are two kinds of parasite, viz., one which confines itself to the urinary tract, and another which is more general in its distribution, involving not only the genito-urinary system, but also the digestive tract, or the lungs, or both.

Of the urinary symptoms, the commonest is hæmaturia. Blood is passed more frequently after exposure or exertion, and Dr. Turner states that the number of tube-like blood-casts observable on the walls of urinals in native compounds after the arrival of a batch of East Coast recruits is astonishing. In advanced cases there may be considerable destruction of the kidney substance, with inflammation and much thickening and roughing of the walls of the bladder (the bladder hardly ever escapes infection) from infiltration by ova which often become calcified. *Bilharzia* ova were found in the urine of 14 per cent. of the 971 cases examined, but stone in the kidney (a common sequel in Egypt) in two cases only.

* Dr. P. G. Stock, "Lancet," 29th October, 1906.

† "Brit. Medl. Journal," Jan. 1st, 1910, p. 16, Dr. Armand Ruffer.

The intestinal symptoms are usually a chronic and obstinate diarrhoea resembling that which accompanies acute tuberculosis, and attended by intense wasting and anæmia. The large intestine is the part usually affected, and, in severe cases, the mucous membrane of the rectum may be infiltrated by the ova. Postmortem, the changes range from acute congestion and thickening to severe ulceration of the bowel, and lead-coloured patches are often to be seen in which are to be found lateral-spined ova. M.O.H. 1906-9
Bilharziosis.
Leprosy.

Dr. May, late Government Bacteriologist, found a cyst containing terminal spined ova in the stomach of an imported Chinaman. Dr. Turner found Bilharzia worms in 34·3 per cent. of the 970 livers examined. Cirrhosis of the liver was noted in 13·6 per cent.

Infection of the Pulmonary System.—In 93 out of 160 autopsies (or 54·37 per cent.) the same observer found that the lungs contained terminal-spined ova. Sixty-nine of these 160 deaths were from pulmonary disease, and in 70·9 per cent. of these 69 cases Bilharzia ova were present in the lungs. Only on two occasions were the worms discovered in the lung substance. Dr. Turner observed no symptoms definitely attributable to ova in the lungs, but their presence undoubtedly pre-disposes to pulmonary tuberculosis and pneumonia. He says “I think there can be little doubt that the numbers of small gritty calcified Bilharzia ova, of about half the size of the small particles of rock which form the cyanide sand, must have a very irritating effect on the lung substance, and in consequence render those organs much more liable to infection with the pneumococcus and tubercle bacillus. I see no reason why, in some instances, they should not be the sole cause of the consolidation of the lung, in certain forms of pneumonia.”

The native remedies include a decoction of the roots of ‘Cassia Beercana,’ a decoction of the leaves of ‘Umrangala Umgubo,’ and a demulcent drink made from the beard of mealie cobs.

Dr. Turner has found drugs of little use, with the exception of urotropine, combined with rest in bed, in cases affecting the bladder.

LEPROSY.

15 coloured cases were notified in 1906-7; 1 white and 8 coloured cases in 1907-8, and 2 white and 14 coloured in 1908-9. All were removed to the Leper Asylum, Pretoria.

With regard to the white cases, one came from Kimberley, the history of the other 2 being as follows:—

Case 1:—Mrs. R., aged 25, is stated to have first shown symptoms of the disease 2 years previous to her examination by a medical man on 21/1/09. She was born in the Wakkerstroom district, Transvaal, in 1884, where she lived with her parents until 16 years of age. The family history does not disclose any previous cases of leprosy.

In 1900 she came to reside in Johannesburg, where she was married in 1901, but has not lived with her husband for over 3 years. She is stated to have lived an irregular life, and was given to drunkenness.

Case 2:—E. E., female, aged 15 years. This case was notified on 1/5/09; the first symptoms were stated to have been noticed 6 months previously, when a nail entered her foot causing a bad sore. One month later both hands closed up. In this case the following family history was obtained:—

The mother had been married twice. Her first husband, by whom she had 4 children, died from leprosy in 1889. Of the 4 children, 2 died from leprosy, and one is now in the Pretoria Asylum with the same disease. The fourth is married and stated to be quite healthy, and living in Pretoria. 17 years ago Mrs. E. married again, having 2 children by her second husband, E. E. the present case, and a boy who is apparently quite well.

E. E. was born at Vaalbank, and stayed in the Wakkerstroom district for a year. The family then moved to Volksrust, remaining there for a month, and on to Charlestown where they lived for 4 years. They then resided for 3 years at Durban and 2 years at Newcastle, from the latter place moving to Johannesburg. Since 1904 the patient has not been out of the Transvaal.

With regard to the coloured cases, the following is the tribal distribution:—

Mozambique	...	10	Tongaland	..	1
East Coast	...	10	Zululand	...	1
Northern Transvaal	...	4	O. R. Colony	...	1
Shangaan	...	3	M'xosa	...	1
Cape Colony	...	3	Baca	...	1
Eastern Transvaal	...	1	Myaambau	...	1

Leprosy is a disease which is segregated by the Government under Ordinance No. 23 of 1904.

M.O.H. 1906-9

NOTIFIABLE INFECTIOUS DISEASES.

Notifiable
Infectious
Diseases.Isolation
Hospital.

These included smallpox, chickenpox, amaas, plague, typhus, enteric, gastric or typho-malarial, malaria, scarlet fever, puerperal fever, dysentery, diphtheria, erysipelas, leprosy, pneumonia, cerebro spinal meningitis and ankylostomiasis.

Under Government Notice No. 909 of the 18th September, 1908, however, the Colonial Secretary, under Section 1 of the Infectious Diseases Notification Amendment Act, 1908, declared that the following diseases from the 1st October, 1908, should cease to be notifiable within the Municipal area of Johannesburg, namely:—Chickenpox, amaas, malaria, typho-malarial fever, intermittent and relapsing fevers, ankylostomiasis and dysentery.

The notice added that—

“By the deletion of typho-malarial fever, it is not intended that enteric (or typhoid) fever, occurring in connection with malaria, should not be notified.”

The deletion of chickenpox and malaria alone from the list of notifiable diseases will effect a considerable saving in the amount paid in notification fees. With the consent of the Colonial Secretary, any of the above diseases can again be made notifiable, and should smallpox again appear in epidemic form it may be advisable to do so as far as chickenpox is concerned. With regard to malaria, the disease is not endemic in Johannesburg, and little advantage was obtained from the notification of large numbers of cases amongst East Coast natives and others who had contracted the disease elsewhere.

During the three years under notice 14,853 cases were notified, viz. :—5,213 amongst whites, 9,274 amongst South African Coloured, and 366 amongst Asiatics. These occurrences are fully discussed elsewhere in this report (see also Tables L, K and M).

The procedure adopted in regard to notified infectious diseases, disinfection, etc., has been the same as in previous years (see report 1904-6) under the heading “Disinfection.”

3,651 houses, 43 schools, 18 mine compounds, and 13 other large premises and 410,540 articles of clothing, bedding, etc., were disinfected.

ISOLATION HOSPITAL (WHITES).

Particulars are appended as to the number, nature, cost and average length of isolation of the Johannesburg cases of infectious diseases treated by Dr. Mehliß (1906-9) in the isolation ward at Rietfontein, which, since the abolition of the Rand Provisional Joint Committee, has been administered by the Government.

	Scarlet Fever.	Measles.	Chicken Pox.	Erysi- pelas.	Diph- theria.	Mumps.	Skin Disease.	Pneu- monia.
Admissions ...	150	22	11	10	3	2	2	1
Recovered ...	146	22	11	10	3	2	2	1
Died ...	4	—	—	—	—	—	—	—

Total Cases ... 202

Total Deaths ... 4

Total cost of Isolation Ward, £3,716 14s. 11d.

PAYMENT BY PATIENTS :—

Recovered ... £1,044 11s. 3d.

Outstanding ... 150 16s. 0d.

Average cost per head per day, 10s. 6d.

Average length of isolation per case, 27·59 days.

As the Council are aware, lengthy negotiations have proceeded between the Government and themselves with regard to the question of responsibility as to cost in pauper cases of infectious disease. In many cases of infectious disease the patient could be isolated at home without danger to the public, provided the necessary medical attendance, nursing, etc., were forthcoming. While free hospital accommodation is provided by the Government for enteric fever and other diseases, a charge is made for the care of zymotic diseases. The question appears to be one of Poor Relief rather than of Public Health, and as such, one which the Council will no doubt consider carefully. As a temporary measure, however, and pending the definite settlement of the question, the M.O.H. has been authorised, without prejudice to the Council's position in the matter, and in order to prevent friction and possible scandal, to isolate at the expense of the Council, all pauper cases of infectious disease recommended by the District

TABLE K.

Monthly Return of Infectious Disease notified in Johannesburg from 1st July, 1906, to 30th June, 1907.

DISEASE.	Race.	Totals.	July, 1906	Aug., 1906	Sept., 1906	Oct., 1906	Nov., 1906	Dec., 1906	Jan., 1907	Feb., 1907	Mar., 1907	April, 1907	May, 1907	June, 1907	NUMBER OF DISTRICT.													Hos- pital.	Non- R'sd'nt.	Un- known.	TOTALS.		
															I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.				E.	C.	
Smallpox	-	E. C. A.	1					1										1													1		
Chickenpox	-	E. C. A.	170 1,175 1	15 20	14 61	20 69	22 59	42 55	18 43	3 19	1 24	3 212	6 205 1	10 262	16 146	8 2	19 5	4 3	14 2	2 2	24 3	35 9	10 2	31 1	5 852	1 82	5 147 1	12 64		1	170	1,175 1	
Amaas	-	E. C. A.	1						1																	1					1		
Typhoid or Enteric Fever	-	E. C. A.	385 342 12	8 9	9 18	17 15 1	28 23 2	26 20 2	41 27 1	50 46 3	43 50 1	63 44	59 30 1	25 26 1	16 34	49 3 4	48 4	33 5 1	26 14	20 10	26 1	30 8	13 1	12 7	36 118 2	11 58 3	9 48 2	24 45	1 41 6	16 4	385	342 12	
Gastric or Typho-Malarial Fever	-	E. C. A.	1					1																1							1		
Malaria	-	E. C. A.	141 238 38	6 9 2	2 9 3	8 3 6	11 14 12	1 14 1	17 7 5	7 25 5	11 34 1	19 34	32 33 2	14 24	13 32	29 1	31 1	11 1	13 1	1 2	6 6	4 4	1 3	4 204 20	7 22 18	9 22	7 4		8 4	141	238 38		
Scarlet Fever or Scarlatina	-	E. C. A.	471 17	36	50	45 6	53 4	51 1	40	24 5	27	30 1	27	35	53	22	33 1	35 6	53	21 2	54 4	74 1	20	10	32	35 3	22	60			471	17	
Puerperal Fever or Puerperal Septicæmia	-	E. C. A.	4 3				1 1	1			1 1				1	1					1 1					2				4	3		
Dysentery	-	E. C. A.	225 506 116	10 10 2	4 4 1	8 8 6	17 15 4	34 32 4	32 51 11	32 107 7	22 78 23	24 69 32	21 61 16	15 46 7	6 25 3	19 1	47 6	7 7	12 7	2 8	12 27	10 3	14 1	14 125 7	8 54 20	12 97 88	18 198		20 4	3	225	506 116	
Diphtheria	-	E. C. A.	16 2	1	3	3 1	2		2			1	1	1	2	1	1	1	4	2 1		3		2	1 1		1			16	2		
Membranous Croup	-	E. C. A.	2 1			2					1										1		1							2	1		
Erysipelas	-	E. C. A.	47 21 16	7 1 1	10 3 5	5 2 3	11 3 2	4 1 2	2 3 2		2 1 1	2	1	1	4	4 1	5 1	6 1	5	1	10	3	1	3 3 5		2 10 5	5 2			1	1	47	21 16
Leprosy	-	E. C. A.	15		2	1	1	1			3	2	1	2	2		1	1	1					4	2	1	5				15		
Intermittent or Relapsing Fever	-	E. C. A.																															
Ankylostomiasis	-	E. C. A.	2 4 1			1		1 1		1				1 1	1	1													1	2	4 1		
Pneumonia	-	E. C. A.	320 1,421 28	49 121 5	43 137 3	35 102 3	34 101 2	20 79 2	21 109 2	14 128 3	5 83 1	18 147 1	27 118 2	17 143 3	37 153	25 23	25 26	33 13	29 27	45 25	31 12	23 39	6 4	10 14	17 482 3	9 369 4	12 247 9	44 123	2	7 9	2 8	320	1,421 28
Cerebro-Spinal Meningitis	-	E. C. A.	17 212 1		1 8	1 3	4 8	2 23	3 21	2 32		1 37	2 23		15	1 2	1	2 1	2 1	1 1		1			84	19		6 90		1	17	212	
Tuberculosis	-	E. C. A.												1												1					1		
Total of all Diseases	-	E. C. A.	1,801 3,960 212	132 177 10	136 242 12	144 211 19	183 229 22	181 228 12	177 263 21	132 365 18	112 297 27	162 547 34	175 472 22	120 516 11	147 413 4	160 33 6	210 45 4	132 29 3	158 54 2	95 49 6	166 23	202 60	66 10 1	82 23	112 1,685 18	71 805 52	72 580 120	178 530	3 77 31	17 13	1,801	3,960 212	
TOTALS	-		5,973	319	390	374	434	421	461	515	436	743	669	647	564	199	259	164	214	150	189	262	77	105	1,815	928	772	708	3	108	30	5,973	

DISTRICT No. 1 includes that portion of Johannesburg (farm Randjeslaagte), south of the Railway and north of Commissioner Street.
DISTRICT No. 2 includes Braamfontein, Hospital Hill and Hillbrow.
DISTRICT No. 3 includes Marshall's Town and City and Suburban.
DISTRICT No. 4 includes Ferreira's, Fordsburg and Mayfair.
DISTRICT No. 5 includes the Brickfields, Vrededorp, the Cemetery and the Locations.
DISTRICT No. 6 includes Jeppes, Jeppes Extension, Belgravia, etc.
DISTRICT No. 7 includes Doornfontein, New Doornfontein, Bertrams, Lorentzville, Judith's Paarl, Troyeville, Kensington Estate, Bezuidehouth Vallev Township and Morriston.

DISTRICT No. 8 includes Berea, Yeoville, Bellevue, Bellevue East and North-Eastern suburban portion.
DISTRICT No. 9 includes Auckland Park, Richmond, Melville, Newlands, Claremont and North-Western suburban portion.
DISTRICT No. 10 includes Paarl's Hoop and Mines from Robinson westwards to boundary.
DISTRICT No. 11 includes Central Mines (from Ferreira to City and Suburban).
DISTRICT No. 12 includes Prospect Town, Denver and the Mines from Meyer and Charlton to Eastern boundary.
DISTRICT No. 13 includes Ophirton, Booyens, Turfontein, Rosettenville, etc. (Southern suburban portion).



TABLE L.

Monthly Return of Infectious Disease notified in Johannesburg from 1st July, 1907, to 30th June, 1908.

DISEASE.	Race.	Totals.	July, 1907	Aug., 1907	Sept., 1907	Oct., 1907	Nov., 1907	Dec., 1907	Jan., 1908	Feb., 1908	Mar., 1908	April, 1908	May, 1908	June, 1908	Number of District.													Hos- pital.	Non- R'sd'nt.	Un- known.	Totals.	
															I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.				E.	C.
Smallpox -	E.	2									1	1																				2
Chickenpox	A.																															
	E.	228	20	18	30	59	51	17	9	1	4	4	6	9	23	25	9	12	9	28	43	19	5	18	14	4	18		1		228	
	C.	802	145	152	119	99	41	10	13	25	19	64	58	57	5	3	3	2	2	2	6	4	3	234	251	275	12					802
Amaas -	A.	2																														
	E.																															
	C.																															
Typhus -	E.																															
	A.																															
	C.																															
Typhoid or Enteric Fever	E.	446	27	4	13	18	42	95	81	64	32	38	17	15	34	26	16	28	17	29	44	35	16	55	19	40	36	2	45	4	446	
	C.	348	26	28	21	30	28	36	51	46	25	17	19	21	1	7	7	9	10	3	4	1	2	91	82	77	26	2	26			348
	A.	20	1	1	1		4			4	5	1	3			1	1	1					1	5	9	2					20	
Gastric or Typho-Malarial Fever	E.	2		2													1				1										2	
	C.																															
	A.																															
Malaria -	E.	71	13	2	1	5	4	6	4	10	2	5	8	11	12	3	3	4		4	3	2	6			22	6		4	2	71	
	C.	439	35	25	15	33	26	26	50	29	35	52	64	49				2	2					15	350	62	12					439
	A.	10				1	2	2	4				1											1	4	1						10
Scarlet Fever or Scarlatina	E.	795	70	65	83	79	80	54	64	37	80	58	57	68	34	131	52	89	19	102	121	48	27	20	24	20	101	1	3	3	795	
	C.	10	1	1	2			1	1			2		2	3	2	1	2	1							1						10
	A.	2				1					1									1							1	1				2
Puerperal Fever or Septicæmia -	E.	16	1		1	1	1		3	1	1	2	4	2	2	3		1	2		1	2				1	1		1		16	
	C.	2			1	1	1														1					1	1					2
	A.																															
Dysentery-	E.	152	3	3	6	41	30	21	10	10	9	7	10	2	17	28	9	7	4	17	12	14	9	4	4	13	2		9	3	152	
	C.	390	16	12	10	35	63	42	46	54	41	45	20	6	4	2	1	3			2		1	79	101	124	52	1	20			390
	A.	58	6	4	1	8	7	5	12	1	6	2	3	3		1			3	2			5		2	46		1				58
Diphtheria	E.	31		2	3	2	1	3	1	3	3	8	1	4	2	1		4	5	2	1	6	7			2	1					3
	C.	3			1	1											1															
	A.																															
Membranous Croup -	E.																															
	A.																															
	C.																															
Erysipelas	E.	55	3	4	4	9	6	4	3	3	4	3	3	9	16	3	1	7	4	4	6	6	1	1		1	1		4		55	
	C.	30	3	5	1	7	2	1		1	1	3	5	1	1			1						13	7	6	2					30
	A.	6		1	2	1	1	1												1				1	2	1						6
Leprosy -	E.	1									1																					
	C.	8	1		1	1		1			1	2	1	1		1								3		3	1					8
	A.																															
Plague -	E.																															
	A.																															
	C.																															
Intermittent or Relapsing Fever-	E.																															
	A.																															
	C.																															
Ankylostomiasis	E.	3	2		1									1		1	1				1				2						3	
	C.	3							1		1			1																		
	A.																															
Pneumonia	E.	323	70	51	36	32	21	8	9	15	19	17	39	6*	36	24	20	22	42	32	34	11	13	19	14	15	22		12	7	323	
	C.	2,313	224	215	201	225	203	176	163	154	207	266	243	36*	13																	

* Pneumonia and Meningitis ceased to be notifiable diseases on 1st June, 1908.

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DISTRICT No. 4 includes Ferreira's, Fordsburg and Mayfair.

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DISTRICT No. 6 includes Jeppes, Jeppes Extension, Belgravia, etc.

DISTRICT No. 7 includes Doornfontein, New Doornfontein, Bertrams, Lorentzville, Judith's Park, Troyeville.

DISTRICT No. 8 includes Berea, Yeoville, Bellevue, Bellevue East and North-Eastern suburban portion.

DISTRICT No. 9 includes Auckland Park, Richmond, Melville, Newlands, Claremont and North-Western suburban portion.



TABLE M.

Monthly Return of Infectious Disease notified in Johannesburg from 1st July, 1908, to 30th June, 1909.

DISEASE.	Race.	Totals.	July, 1908.	Aug., 1908.	Sept., 1908.	Oct., 1908.	Nov., 1908.	Dec., 1908.	Jan., 1909.	Feb., 1909.	Mar., 1909.	April, 1909.	May, 1909.	June, 1909.	NUMBER OF DISTRICT.													Hos- pital.	Non- R'sd'nt.	Un- known.	TOTALS.	
															I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.				E.	C.
Smallpox -	E. C. A.																															
Chickenpox	E. C. A.	106	29	28	44	5									1	22		1	6	9	4	8	1	10	4	6	34			106	67	
Amaas -	E. C. A.	67	23	33	11										2			1			2		1	30	17	14						
Typhoid or Enteric Fever	E. C. A.	373	9	16	10	13	32	38	49	28	70	67	35	6	21	19	14	25	3	20	25	6	35	16	23	9	43		112	2	373	
	E. C. A.	296	16	12	19	14	16	28	36	32	26	40	29	28	2			4	15		4	2	9	27	72	75	6		79	1	296	3
Gastric or Typho-Malarial Fever	E. C. A.	3									1	2			1										1	1						
Malaria -	E. C. A.	10	6		4																								10	10		
	E. C. A.	117	33	39	27	18																							117	3		
Scarlet Fever or Scarlatina	E. C. A.	3	48	52	70	43	64	34	20	23	28	41	77	64	64	78	31	74	36	51	108	32	16	12	10	13	38		3	564	3	
	E. C. A.	3			1	1	1			1								1	1					2					1			
Puerperal Fever and Puerperal Septicæmia	E. C. A.	13	4	1		1	3	1					3		2		2	1	2	3	1		2				1		13	1		
	E. C. A.	1					1																									
Dysentery	E. C. A.	7	3	2	2											2				2			1			1	1		7			
	E. C. A.	27	11	10	6														1				1	5	5	14	1				27	
Diphtheria	E. C. A.	5	2	1	2														1						4						5	
	E. C. A.	46	4	3			4	3	1	3	3	5	5	15	3	3	5	2	3	4	9	3	1		6	1	4		3	46	2	
	E. C. A.	2	1	1																						1	1					
Membranous Croup -	E. C. A.																															
	E. C. A.																															
Erysipelas	E. C. A.	35	4	6	5	2	3	2	3	1	1	2	3	3	5	2	3	6	1	2	8	4	1	1			4		35		34	
	E. C. A.	34	1	2	4	3	4	6		3	2	2	5	2				1	2					3	12	16					34	
	E. C. A.	2							1				1													1	1				2	
Leprosy -	E. C. A.	2																1														
	E. C. A.	14	1	1	1	1	1	1	3	1	1	1		2					1				1	5	2	4			1		14	
Intermittent or Relapsing Fever	E. C. A.																															
	E. C. A.																															
Ankylostomiasis	E. C. A.	2		2																					1	1					2	
	E. C. A.																															
Pneumonia	E. C. A.																															
	E. C. A.																															
Phthisis -	E. C. A.	26	2		1		1	7	2		5	3	1	4	6		2	1	2	4	1			1	2	1	1	1	3	1	26	
	E. C. A.	44	5		1	3	2	10	3	3	4	9	1	3	5		6		3					2	16	5			6		44	
	E. C. A.	1							1						1																1	
Totals of all Diseases	E. C. A.	1,182	109	108	136	64	107	85	76	55	107	118	125	92	102	126	57	111	54	101	152	50	57	39	45	30	125	1	129	3	1,182	
	E. C. A.	607	91	100	69	40	25	45	42	40	33	52	35	35	9		6	6	23	6	2	12	72	127	130	9		203	2		607	
	E. C. A.	14	3	2	3				2		1	2	1		2			1					1	6	1			3			14	
TOTALS	-	1,803	203	210	208	104	132	130	120	95	141	172	161	127	113	126	63	117	78	101	158	52	69	111	173	176	135	1	335	5	1,803	

DISTRICT No. 1 includes that portion of Johannesburg (farm Randjeslaagte), south of the Railway and north of Commissioner Street.

DISTRICT No. 2 includes Braamfontein, Hospital Hill and Hillbrow.

DISTRICT No. 3 includes Marshall's Town and City and Suburban.

DISTRICT No. 4 includes Ferreira's, Fordsburg and Mayfair.

DISTRICT No. 5 includes the Brickfields, Vrededorp, the Cemetery and the Locations.

DISTRICT No. 6 includes Jeppes, Jeppes Extension, Belgravia, etc.

DISTRICT No. 7 includes Doornfontein, New Doornfontein, Bertrams, Lorentzville, Judith's Paarl, Troyeville, Kensington Estate, Bezuidenhout Valley Township and Morriston.

DISTRICT No. 8 includes Berea, Yeoville, Bellevue, Bellevue East and North-Eastern suburban portion.

DISTRICT No. 9 includes Auckland Park, Richmond, Melville, Newlands, Claremont and North-Western suburban portion.

DISTRICT No. 10 includes Paarl's Hoop and Mines from Robinson westwards to boundary.

DISTRICT No. 11 includes Central Mines (from Ferreira to City and Suburban).

DISTRICT No. 12 includes Prospect Pown, Denver and the Mines from Meyer and Charlton to Eastern boundary.

DISTRICT No. 13 includes Ophirton, Booyens, Turffontein, Rosettenville, etc. (Southern suburban portion).



Surgeons. The expenditure in each case is notified to the Assistant Colonial Secretary with a statement that the amount will be paid by the Council under protest and solely from the humanitarian point of view. It is hoped that a solution satisfactory to all may soon be arrived at.

M O.H. 1906-9
Isolation Hospital.
Receiving Hospital,
Ambulance Equipment.
Bacteriologist Diagnosis.
Curative Sera.

RECEIVING HOSPITAL.

With the re-layout of Newtown, the old Receiving Hospital was demolished, but the premises known as De Meillon's House were obtained in their place, have now been put in order and a caretaker installed.

AMBULANCE EQUIPMENT.

There are two well fitted modern two-horse ambulances for whites and a suitable covered four-wheeled vehicle with stretcher for natives. There are also 5 light-running four-wheeled canvas-covered American vans for removing clothing, contacts, sitting-up patients, etc., and one Cape cart.

These vehicles were served by 2 horses and 8 mules, but in January, 1909, the transport arrangements were undertaken by the Cartage Branch.

During the period under review 218 white cases and 1,521 coloured were removed to Rietfontein by the above transport. In addition, 79 whites and 2 coloured patients were removed to the Johannesburg Hospital, and transport for 21 lepers to Pretoria was arranged for. A few cases were also removed from outside districts at the request of, and on payment by, the local authorities concerned.

A record was kept during 1906 of the distances covered by the various vehicles, the total mileage amounting to 14,998 miles.

BACTERIOLOGICAL DIAGNOSIS.

The following are particulars of the specimens examined under this heading for the Town Council, at the Government Laboratory, Hospital Hill, during the two years under review :—

Disease Product.	Positive.	Negative.	Doubtful.
Typhoid	171	18	
Tuberculosis	318	80	
Diphtheria	29	7	
Meningitis	58	43	
Silicosis	9	2	
Bilharzia	5	—	
Plague	—	1,266	
Ankylostomiasis	14	12	
—	604	1,428	—

These figures do not include rats examined for suspected plague.—(v. p. 30)

CURATIVE SERA.

The Public Health Committee on September 15th, 1902, sanctioned an arrangement by which the supply of therapeutic sera is obtained from Messrs. Burroughs, Welcome & Co., of London, and issued at cost price to medical practitioners, or gratuitously in necessitous cases. The amount of each serum obtained and distributed between 1st July, 1906, and 30th June, 1909, is as follows :—

Antitoxin.	Phials Obtained.	Phials Distributed.
Anti-diphtheritic ...	218	212
Anti-streptococcal ...	768	508
Anti-dysenteric ...	188	56
Anti-pneumonia, No. 1 ...	72	59
do. No. 2 ...	78	61
Anti-meningococcic ...	15	15

M.O.H. 1906-9

NURSING HOMES.

Nursing
Homes.

There are 15 registered nursing homes in Johannesburg. These places are inspected and licensed by the Public Health Department, and the Council can withdraw the licence if nuisance arise.

Slaughter
Poles and
Public
Abattoir.

Bakehouses.

In January, 1904, the Transvaal Medical Society recommended "that the space requirements for Nursing Homes should be as follows:—(a) for all infectious and all serious operation cases not less than 1,200 c. feet of free air-space, and 100 sq. feet floor space; (b) for all other cases not less than 800 c. feet of free air-space and 75 sq. feet of floor space."

SLAUGHTERPOLES AND PUBLIC ABATTOIR.

During the year 1908 the Public Health Committee succeeded in overcoming the preliminary difficulties in the way of site, etc., which have for some years delayed the provision of much-needed public abattoirs, and the Council set apart 10 acres of ground in Newtown, viz., 4 acres for the Abattoir and 6 for the Live Stock Market. This site adjoins the Kazerne and is valued at £23,000.

The Council then offered three prizes of £150, £125, and £100 respectively for the three best designs of a thoroughly up-to-date abattoir, equipped with the best appliances. This competition was decided in June, 1908, but it was considered that none of the premiated designs were entirely suited to local conditions. Accordingly, the Town Engineer, M.O.H., and M.V.S. who had done a considerable amount of preliminary work in connection with the question of abattoir accommodation for Johannesburg, and were personally familiar with the construction of many modern European abattoirs, were instructed to collaborate in the preparation of plans for an abattoir and live-stock market. The provision made included railway siding, lairages and pig pens, main slaughter hall, main cooling hall, pig slaughter hall, tripery and gut-seraping rooms, together with change-house, bathing and latrine accommodation for the employes, administration offices, Director's house, etc.

The total value of the land for both schemes, as already stated, is £23,000. The estimated cost of the abattoirs, including fittings, roads, lighting, water-supply, sidings, drainage, buildings purchased from Middelburg Cantonments for Director's house, offices, etc., is £46,350. Cattle Markets, including construction, roads, fencing, weigh-bridges, sidings, etc., £16,920. To this must be added the estimated cost of a Manlove Alliott installation for converting offal and drying blood. The total cost of the abattoirs and live-stock market is therefore £91,770.

Both the cattle market and the abattoirs are served by railway sidings. Provision is made in the abattoir for the slaughtering of 400 oxen, 3,000 sheep, and 400 pigs daily. 24 slaughtermen can all work at the same time.

The Public Health By-laws, Chapter VIII., Article 21 (gazetted July, 1903), provide that the Council may require all butchers' meat slaughtered outside the Municipality and imported for the purpose of being sold for the food of man, to be brought between the hours of 7 a.m. and 5 p.m., for examination to a dead-meat depot to be established by the Council, and any person who shall sell any butchers' meat within the Municipality in contravention of such requirement, shall be liable to a penalty not exceeding £20. In the past it has been impracticable to enforce this by-law; but, in connection with the new abattoirs, a dead-meat dépôt has been established to which all such meat as above specified must be brought, to be examined, passed and stamped before its sale will be permitted within the Municipal Area. The M.O.H. is not aware of any other British community in which this salutary provision can be enforced.

At present there are within the Municipal area 17 slaughter houses, or 'slaughterpoles' as they are locally called. 14 are situated on Government ground, west of the Municipal Compound at Vrededorp, and one in Brixton Township, one at the Jumpers, and one at Prospect Township. These will be closed as soon as the new Abattoir is opened.

A Special Inspector is charged with the duty of looking after these places and inspecting the meat killed therein.

During the 3 years he examined 72,629 carcasses of beef, 461,832 sheep, 35,644 pigs, and 883 calves.

9 carcasses, 720 lbs. of beef, 181 carcasses of mutton, 471 pigs, 54 goats, 161 cases and 10,970 lbs. of fish, 53 lbs. of bacon, 28 sheep's livers, 3 sheep's plucks, 10 ox livers, 23 ox plucks, 13 ox heads, 50 ox tails, 4 cows, 1 calf, and 3 loads of offal were condemned.

BAKEHOUSES.

At the close of the period under review, a systematic inspection of bakehouses was carried out, partly in consequence of an article which appeared in the public press, and which, except in regard to one bakery, was of a highly-coloured and grossly exaggerated nature.

Repeated protests have been made against the employment of black labour in bakehouses, M.O.H. 1906-9
 apparently regardless of the fact that in the majority of dwellings in Johannesburg the food is Bakehouses.
 prepared and cooked by Kafirs. The M.O.H. offers no opinion as to the social aspect of the Dairys and
 question, which is entirely outside his official province; but, as regards its purely Public Health Milkshops.
 aspect, sees no objection to the employment of natives in bakeries, provided those natives are
clean.

From the following summary of results of inspection, it will be clear that there is not much to complain of as regards the condition of Johannesburg bakehouses:—

1. *Type of Building.*—55 bakehouses are built of brick; 9 of wood and iron, brick-lined, and 11 of wood and iron.
2. *Lighting.*—In every case this is returned as sufficient.
3. *Ventilation.*—In every case this is returned as sufficient.
4. *Nature of Floors.*—29 bakehouses have floors of cement concrete; 23 of brick set in cement, and 18 of granolithic or similar material.
5. *Cleanliness.*—In 50 cases the condition of the premises in respect of cleanliness is described as “Good” or “Satisfactory”; in 21 as “Fair” or “Passable,” and in 4 as “Requiring Improvement.”

A circular letter has been addressed to each licensee whose premises have been described as “Good” or “Satisfactory.”

To licensees whose premises have been returned as “Fair,” “Passable,” or “Requiring Improvement,” has been sent a somewhat similar letter, in which is emphasized the necessity for scrupulous cleanliness, and a warning that proceedings will be taken in case the Inspector is not thoroughly satisfied with the condition of the bakehouse.

In these circular letters attention is also called to the necessity for the cleanliness of employees and their clothing, and to the obligation to expose a copy of the By-laws mounted on cardboard in each bakehouse.

7. *Number of Employees.*—The returns shew that 187 white and 174 coloured persons are employed inside the bakehouses of the City; the outside employees number 76 white and 72 coloured.
8. *Facilities for Employees to Wash.*—In 54 cases pails or basins and soap are provided; in 4 cases shower baths; in 10 instances the facilities consist of a water-tap over a gully, while in 1 case the bakehouse is not in use at present, and no special provision exists.
9. *Cleanliness of Clothing of Employees.*—As regards 41 bakehouses the return is “Clean” or “Satisfactory”; for 32 others it is “Fair,” while in 2 cases improvement is necessary.

The M.O.H. has recommended that the existing By-law relating to the cleanliness of persons engaged in bakeries, etc., shall be amended to read as follows:—

“8. Every person licensed under these By-laws shall to the satisfaction of the Council—

“(c) Cause all persons employed on his licensed premises in making bread, “pastry or confectionery, or in directly handling the materials used in “making bread, pastry or confectionery, to be dressed in clean white “clothing whilst so employed; and he shall also cause all persons employed “in handling or selling bread, pastry or confectionery to be clean and dressed “in clean clothing whilst so employed.”

DAIRIES AND MILKSHOPS.

369 Dairies and 72 Milkshops are licensed, and kept under supervision.

The cleanliness of dairies and of methods leaves much to be desired, though considerable improvement has been effected. One of the greatest difficulties is to ensure the proper cleansing of bottles and receptacles used for holding milk. In this connection it must be clearly realised by all engaged in the production and handling of milk that what is popularly called cleanliness is not sufficient in the case of milk vessels, and that scrupulous care in the washing and later scalding of these receptacles is necessary.

Practical experience has also demonstrated that if the milk supply is to be properly controlled, the Council must take discretionary powers to refuse licences to individuals who, in the Council's opinion, are not fit and proper persons to be entrusted with such responsibility. There are at present amongst the licensed dairymen a considerable number of apparently very low-class Russians and Poles, whose ideas of personal and domestic cleanliness render them, in the opinion of the M.O.H., quite unfit to have anything to do with the handling of milk intended for public consumption. For example, one, Barney Orelowitz, was convicted 3 times for breaches of the By-laws regulating his trade, of such a nature as to endanger the public health. His licence was accordingly cancelled. His wife then applied for a licence on the same premises, and it had to be granted. Within a short time she was prosecuted and convicted for having her dairy premises in a filthy condition, and her licence was suspended for three months. The son then made application for the licence, but decision in regard thereto was not arrived at during the above mentioned period of 3 months' suspension. Later on in the year, Mrs. Orelowitz was twice again convicted of offences against the Dairy By-laws. These two latter offences were, however, not of such a nature as to endanger the

M.O.H. 1906-9
Dairys and
Milkshops.
Inspection of
Foodstuffs.

public health, and therefore at the end of the year the Council was compelled to renew the right of these people to be a public danger to the community ; for it is obviously impossible to keep an Inspector stationed on the premises, and unless some such precaution be adopted there can be no feeling of security in regard to the cleanliness of the milk which they distribute.

The Dairy Farmers' Association have continued to co-operate readily with the Public Health Department ; and, as a result of recent conferences, the following new By laws providing for the delivery of milk in receptacles of assized imperial measure, and of approved pattern have been gazetted (13th January, 1910) :—

“13. On and after the 1st May, 1910, no person shall sell, offer, or expose for sale, “or have in his possession for the purpose of sale, or shall deliver any milk in “bottles or cans, or from any churn or other receptacle which is not of a “material and pattern approved by the Medical Officer of Health in writing ; “and no person shall use in connection with any such approved receptacle for “milk any stopper or lid which is not of a material and pattern similarly “approved.

“Every person shall, on every occasion before use, make proper provision for the “effectual cleansing of such bottles, receptacles, stoppers, and lids by boiling “them, or by such other process as may be approved by the Medical Officer of “Health.”

“17. (a) On and after 1st May, 1910, no person shall sell, offer for sale or deliver, or “cause to be sold, offered for sale or delivered, any milk except as is provided “in sub-section (b) otherwise than in assized measures of approved design, “having a capacity of an Imperial gallon or some legal multiple or sub-multiple “thereof. This By-law shall not apply to tinned milk.”

“(b) Where milk is delivered from the vessel in which it is conveyed into a “receptacle provided by the purchaser, such milk shall be measured out by “means of an assized measure of approved design.”

INSPECTION OF FOODSTUFFS.

The following goods were condemned by the Food and Drugs Inspector :—

	Cases.	Tins.	lbs.	Dozen.	Barrels & Baskets.	Whole.
Army Rations	10					
Condensed Milk	29					
Fish	346		29,909		21	
Sheeps Heads						112
Fruit	671					
Groceries	11					
Cheese	14					36
Meat	38	2,775	1,600			
Hams and Bacon	7		239			152
Eggs	2			110		
Poultry	36					
Pigs						74
Butter	1					

A special inspector examines foodstuffs arriving at the Kazerne.

During the period under review, he passed 85,011,554 lbs. of meat, 19,463,842 lbs. of fish, 994,383 lbs. poultry, 166,784 lbs. game, and 1,731 live pigs.

He condemned 23,183 lbs. meat, 61 boxes and 154,768 lbs. fish, 4 cases crayfish, 439 lbs. game, 10,926 tins milk, 22 cases, 100 barrels and 389 tins fruit, 206 bags vegetables, 40 dozen oysters, 131 live pigs, 600 lbs. offal, 1,500 oranges, 285 jars prawns, 79 cases and 200 tins salt herrings, 219 ducks, 2 carcasses and 2,561 lbs. pork, 364 ox tongues, 61 cases cheese, 18 quarters beef and 71 lbs. polony.

A considerable quantity of meat and fish was condemned on arrival by train, largely owing to imperfect refrigerating arrangements. M.O.H. 1906-9
Inspection of Foodstuffs.

As cases of ptomaine or food poisoning are common, more especially during the hot summer months, the following handbill setting forth certain simple precautionary measures was drawn up and circulated in November, 1908 :— Ptomaine Poisoning.
Analysis of Foods.

Cases of Ptomaine Poisoning or Food Poisoning are common, more especially during the hot summer months, and attention is therefore invited to the following observations in regard thereto :—

SOURCES OF DANGER.

All kinds of food may give rise to this form of poisoning, but fish, tinned fish (*e.g.* sardines), tinned meats, sausages, pork, ham, tongues, veal, beef, pies and milk are chiefly responsible.

The greatest danger is incurred by eating raw or imperfectly cooked food, or food which has been kept for some time after cooking.

PRECAUTIONS.

1. No fish nor meat should be eaten which is stale, discoloured, or smelling offensively. During the summer months it is safer to refrain as much as possible from eating any fish.
2. All tinned fish or meat should be rejected if the tin is blown or discoloured when opened.
3. Cleanliness in the preparation and storage of all foodstuffs, both before and after cooking, is imperative. Kitchens, pantries and similar places must be kept thoroughly clean.
4. Food should be stored in a clean, well ventilated place, free from flies and dust, and not in dirty cupboards.
5. Cooking may lessen the activity of poisons produced in foods. All meat should therefore be well cooked.
6. Milk should be boiled for five minutes and then cooled in a carefully covered vessel.

The attack usually starts with abdominal pains, diarrhœa or vomiting, headache and perhaps faintness ; if severe, medical advice should be at once sought.

ANALYSIS OF FOODS, 1906-9.

In addition to the 2,177 water examinations (see p. 46) some 987 articles of food were examined during 1906-9 at the Government Laboratories. Details are appended :—

<i>Number and Description.</i>			<i>Genuine or Pure.</i>	<i>Adulterated or Impure.</i>	<i>Doubtful.</i>
743	milk	...	669	74	—
134	butter	...	128	6	—
1	wine	} (<i>for alcoholic strength</i>)	1	—	—
1	hop beer		—	1	—
2	kaffir beer	...	2	—	—
1	beer	...	1	—	—
42	ærated waters (<i>for lead</i>)	...	42	—	—
61	coffee (<i>for chicory</i>)	...	57	4	—
2	tinned bloaters	...	—	2	—
3	flour (<i>mouldy</i>)	...	—	3	—
3	ice (<i>if pure water</i>)	...	3	—	—
1	cream	...	1	—	—
1	pork (<i>for cysticercus</i>)	...	1	—	—
1	cheese	...	1	—	—
3	vinegar (<i>whether malt?</i>)	...	3	—	—
2	pea soup	...	2	—	—
1	chaff	...	1	—	—
1	biscuits	...	1	—	—
11	condensed milk	...	1	9	1
3	peas	...	—	3	—

This gives an average of 329 samples per year, or 3·4 per annum per 1,000 of the white population, as compared with 5·3 per 1,000 in 1907 of the population (1901 census) in London and 2·5 in the English Provinces†. Formerly it was understood by the Local Government Board of England that 1 sample per 1,000 of the population should be aimed at ; but, as will be seen from above, this figure is considerably exceeded at the present time. The English Board of Agriculture tries to encourage the taking of 3 per 1,000, and divide these amongst milk, butter and cheese*.

† “*Sale of Food and Drugs*”—*Extracts from Annual Report of Local Government Board (England) 1907-1908.*

* *Letter to M.O.H., dated 9th September, 1909, from “Department of Inspector of Foods” of Local Government Board, England.*

M.O.H. 1906-9

MILK ANALYSIS.

Milk Analysis.

It has been stated by the late President of the Dairy Farmers' Association that the number of samples of milk taken in Johannesburg is much too low. Johannesburg is, therefore, contrasted in this respect with 20 English towns, taken at random from the Local Government Board's Report, 1907-8, on "The Sale of Food and Drugs Act":—

TOWN.	POPULATION.	MILK SAMPLES.		
		Taken.	Ratio to Population.	Adulterated.
Battersea	168,907	853	5·07	85
Islington	334,991	603	1 80	40
Woolwich	117,178	355	3·03	17
Kensington	176,628	257	1·46	12
Manchester	606,824	1,190	1·96	55
Birmingham	522,204	830	1·59	85
Bristo	339,042	657	1·93	83
Hul	240,259	495	2·06	14
Grimsby	63,138	138	2·19	11
Lincoln	48,784	54	1·12	15
Newcastle-on-Tyne ...	247,023	428	1·73	57
Bath	49,839	101	2 06	8
Oxford	49,336	33	0·67	4
Croydon	133,895	203	1·52	16
Brighton	123,478	332	2·69	31
Derby	114,848	50	0·43	4
Plymouth	107,636	106	0·99	10
Portsmouth	188,133	623	3·31	59
Leicester	211,579	218	1·03	4
Nottingham	239,743	281	1·17	56
JOHANNESBURG (say) ...	(say) 100,000 Whites*	264	2·64	40

* Such milk as is used by the large Coloured population is practically all tinned milk.

Johannesbnrg's ratio of samples to popnlation is therefore below that of Battersea, Woolwich and Portsmouth, equal to that of Brighton, and above that of the remaining 16.

Appended is a tabnlated summary of the resnlts of analyses and prosecutions :—

	1906-7.	1907-8.	1908-9.	Total. 1906-9.
No. of Samples taken ...	235	264	244	743
No. deficient Solids not Fat ...	31	33	27	91
No. do. Fat ...	5	7	3	15
No. with preservatives ...	4	—	—	4
No. of Prosecutions ..	15	7	6	28
Amount of Fines	£105	£25	£22	£152

In many instances the fines inflieted for adulteration of milk were quite insufficient to have any deterrent effect. It is obviously an exceedingly profitable transaaction to sell water, which costs 6d. per 100 gallons, at the price of milk, viz., 4d. per pint ; and the frequent failure of

the Court to realize this very patent fact not only adds to the difficulties of the Public Health Department, but is a grave injustice to the honest milk-dealer. Local dairymen are further seriously handicapped by the fact that public prosecutors, *e.g.*, at Standerton, have refused to prosecute in respect of adulterated milk consigned by rail to Johannesburg, on the ground that it may have been tampered with in transit, as consignors usually fasten the cans with wire only. The Medical Officer of Health submits that this is simply premiating carelessness and fraud; and that if milk consignors will not take the trouble to lock their cans, they should certainly take the consequences of their neglect.

M.O.H. 1906-9

Milk Analysis.

Milk-Blended Butter.

Adulteration of Potable Spirits.

It is estimated that about 1,000 gallons of milk arrive in Johannesburg from rural districts in the Transvaal, Natal and the O.R.C. As regards the production and handling of the major part of this source of supply, the Council has practically no control; and, by reason of the great distances involved, effective reformation in this respect will, it is feared, long remain a matter of considerable difficulty.

“MILK-BLENDED” AND “WATER-BLENDED” BUTTER.

In November, 1906, complaint was made that the butter delivered to a certain hotel, though palatable at first, quickly became rancid and was of little use for cooking. Inquiry disclosed the sale in considerable quantity of butter containing much more than the permissible limit (16 per cent.) of water, which being described as ‘milk-blended’ butter was regarded by many as superior in quality to ordinary butter. Samples were taken during course of delivery at two hotels, and also from the vendor’s depôt, and found to contain respectively 44·7 per cent., 48·6 per cent., and 48·8 per cent. of water. Prosecution followed, the Medical Officer of Health pointing out that water should not be sold as butter, that it was a greater fraud to sell milk-blended or water-blended butter than to sell a mixture of margarine and butter, and that milk-blended butter does not keep well. The pronouncement of the English Select Committee on the Butter Trade (1906) was quoted in support, and the defendant was convicted and fined £80 in all.

The following byc-law was then drafted, and was gazetted on 5th July, 1907:—

“15b. Every person who shall sell, offer or expose or consign or deliver for sale any butter in which the percentage of water has been increased by the blending of milk or water therewith, shall cause to be attached to each parcel thereof so offered or exposed or consigned or delivered and in such a manner as to be clearly visible to the purchaser, a label marked in printed capital letters not less than one and-a-half inches square ‘Water-blended butter,’ and every person selling, offering or exposing for sale or consigning or delivering such butter by retail, save in a package duly branded or durably marked as aforesaid, shall in every case consign or deliver the same to the purchaser in one or more paper-wrappers, on the outside of each of which shall be printed or labelled the words ‘Water-blended butter’ in capital block letters at least half-an-inch long, and distinctly legible, and no other printed matter nor device shall appear on any such wrapper,”

It will be seen that this is somewhat similar to Section 9 of the English Butter and Margarine Act, which became law on 9th August, 1907.

ADULTERATION OF POTABLE SPIRITS.

This question was dealt with at some length in the Report for 1904-6 (v. pp. 50-51), and it was then pointed out that, till Mr. Fordham’s judgment in the costly Islington case in November, 1905, was either confirmed or reversed, it would be useless to institute similar proceedings in Johannesburg.

The result of this case was regarded by whiskey traders as so serious that a Royal Commission was appointed in England, in February, 1908, to inquire and report (*inter alia*):

1. Whether, in the general interest of the consumer, or in the interest of the public health, or otherwise, it is desirable—

- (A) “To place restrictions upon the materials or the processes which may be used in the manufacture or preparation in the United Kingdom of Scotch whiskey, Irish whiskey, or any spirit to which the term whiskey may be applied as a trade description ;
- (B) “To require declarations to be made as to the materials, processes of manufacture or preparation, or age of any such spirit ;
- (C) “To require a minimum period during which any such spirit should be matured in bond.”

On 24th June, 1908, an Interim Report was made containing the following conclusions, with reservations as to the special significance attachable to certain trade designations, *e.g.*, “Scotch,” “Irish,” etc. :

- “1. That no restrictions should be placed upon the processes of, or apparatus used in, the distillation of any spirit to which the term “whiskey” may be applied as a trade description.

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Adulteration of
Potable
Spirits.

Tinned Meat.

- “ 2. That the term “ whiskey ” having been recognised in the past as applicable to a
“ potable spirit manufactured from (1) malt, or (2) malt and unmalted barley or
“ other cereals, the application of the term “ whiskey ” should not be denied to
“ the product manufactured from such materials.”

The Final Report was presented in July, 1909. In the first place, the Commissioners confirm and explain the grounds of the above-quoted conclusions, and in regard to whiskey amplify them as follows :—

“ In our opinion, the use of the terms ‘ Scotch ’ and ‘ Irish,’ as applied to whiskey,
“ cannot be denied to any whiskey distilled in Scotland and Ireland respectively.

“ Our general conclusion, therefore, on this point of our inquiry is that ‘ whiskey ’ is a
“ spirit obtained by distillation from a mash of cereal grains saccharified by the
“ diastase of malt ; that ‘ Scotch whiskey ’ is whiskey, as above defined, distilled
“ in Scotland ; and that ‘ Irish whiskey ’ is whiskey, as above defined, distilled
“ in Ireland.”

This definition, it will be observed, excludes materials such as potatoes, beet and molasses.

The Commission dismisses any suggestion that pot still whiskey is superior for any purpose to patent still whiskey. It is further unable to find any proof that potable spirits are more wholesome for being matured by age.

Next, with respect to ‘ declarations ’ as to materials, manufacture and age of whiskey, they state that they—

“ cannot recommend compulsory labelling as a means of protecting the consumer of
“ whiskey. At the same time, if any mark or label is used, such mark or label
“ should be a true description of the spirit contained in the labelled vessel, in
“ accordance with the principles of ‘ The Sale of Food and Drugs Act, 1875,’
“ and of ‘ The Merchandise Marks Acts.’ ”

With regard to par. 1 (c) of terms of reference, the Commissioners conclude that—

“ It is not desirable to require a minimum period during which spirits should be
“ matured in bond.”

Brandy.—The Commissioners declare that the term ‘ brandy ’ is—

“ applicable to a potable spirit manufactured from fermented grape juice, and from no
“ other materials.” Further, “. . . that the determination of the application
“ of the term ‘ brandy ’ in this country cannot be controlled by the nature of the
“ apparatus or the process used in the distillation of the spirit.”

Rum.—is defined as “ a spirit distilled direct from sugar-cane in sugar-cane growing
“ countries.”

“ Jamaica Rum ” is rum made in Jamaica in the old pot-still.

“ Imitation Rum ” is rum imported from countries in which sugar-cane does not grow.

Definitions of “ Geneva ” or “ Hollands ” and of gin are also given.

As regards Liqueurs, it is considered undesirable to impose any restrictions, provided these spirits contain no ingredients injurious to health.

As the outcome of the Commissioner’s prolonged deliberations, the question is left very much where it was, their conclusions going very little further than those of the Select Committee of 1890. No suggestion is made of fresh legislation, nor of the inauguration of a new system of control by which the quality of supply of potable spirits should be improved.

It is very interesting, however, to note that the Commissioners suggest, in connection with prosecutions under the Sale of Foods and Drugs Acts, that statutory provision might with advantage be made for affording to the presiding magistrate assistance in determining the cases submitted to him by authorising him to obtain, if he thinks fit the assistance of two assessors, being persons of practical or scientific knowledge of the matters involved to sit with him and advise him thereon. It may also be desirable, they think, to form under authority a panel from which such assessors may be selected. Lastly, they offer the suggestion that a committee of skilled persons be formed under Government authority to assist in mitigating some of the difficulties of the subject by advising on technical questions which affect the administration of the Sale of Food and Drugs Acts and the practice of public analysts.

TINNED MEAT SUPPLIES.

In view of the large amount of canned meatstuffs consumed in Johannesburg, it is of interest to record the fact that on the 12th January, 1909, the War Office Committee on the Food of Soldiers issued its third report, with an appendix by Major Beveridge, R.A.M.C., and Capt. Faucus, R.A.M.C., on the Composition of Tinned Meats. The samples examined varied in age from a few months to 5½ years ; the last—a sample of roast mutton—was remarkably well preserved and quite fit for consumption.

'Can-burn,' that is the blackening of tins inside, is due to sulphide of tin and iron, and occurs at the time of sterilization, particularly in meat which is alkaline from decomposition of the protein sulphur-holding compounds. Perfectly fresh meat acid in reaction can be sterilized by 120 deg. to 130 deg. C., without blackening of the tin. Alkalinity and a high temperature favour blackening. The blackening is not harmful to the consumer. M.O.H. 1906-9
Tinned Meat.
Water Supply.

The "blowing" of tins is due to the spores of *Bacillus Cadaveris Sporogenes* of Klein (*Bacillus Putrificus Coli* of Bienstock), which are extremely resistant to heat. This organism is present in the colon and contaminates all meat. It may be present in the meat at packing, may not be destroyed by the so-called sterilization, may remain inert for long periods if the tins are stored at a low temperature, but may develop if the temperature reaches 37 deg. C. or thereabouts. It is non-pathogenic to animals, but decomposes the meat and renders it unfit for human consumption. As it does not develop much below the body temperature, meat might be contaminated by it and yet be kept for months without showing signs of decomposition or blowing if stored in a cool place; neither would the temperature of the 'warm-room,' in which manufacturers deposit tinned foods for a short time as a testing chamber, be sufficient to cause growth of this bacillus. *But if taken to a hot climate the whole consignment might speedily become unfit for use.*

These facts elucidate the curious point which has long puzzled manufacturers and dealers in tinned-meat supplies, viz., that tins of meat which have passed the makers' tests, and have kept good for months or even years, suddenly become blown and unfit for use. It was recognized that this occurrence was not due to injury of the tin through rust and entrance of air organisms, for if so, the gas produced by putrefaction would have found its way out and no blowing would have resulted.

The recommendation is accordingly made that the temperature of the fluid in which canned-meat tins are sterilized should be raised to 120 deg. C. (240 deg. F.) and that this should be kept up for one hour. This is a considerably higher and more prolonged sterilization than is the practice at present. (*Vide B.M.J. and Lancet, 17/7/09.*)

The practical lesson for vendors of tinned meats in South Africa is that these commodities should be kept either in cool cellars or preferably in cold storage.

As pointed out in previous reports, there is real necessity for having the date of packing clearly and reliably stamped on the containing vessel of all canned food. In this connection the following recent recommendations to the Local Government Board by the Metropolitan Branch of the Incorporated Society of Medical Officers of Health are of interest:—

- "1. The name and address of the manufacturer, and the date of canning shall be impressed on the cans.
- "2. It shall be unlawful to sell for any purpose canned goods that are unfit for human consumption, and it shall be the duty of any person in possession of unsound canned goods to notify and surrender same to the local authority, who shall destroy such unsound food free of charge.
- "3. A certain number of tins (say one per cent.) from each consignment shall be opened on importation and the contents examined under the supervision or instructions of the Sanitary Authority concerned, prior to such canned foods being placed on the market.
- "4. Tins which are known in the trade as 'doubtfuls' shall be deemed to be unfit for human consumption.
- "5. Food intended for canning shall be inspected by independent officials prior to being canned, and all foods shall be canned under strictly hygienic conditions.
- "6. In the opinion of the Branch the use of preservatives in canned foods is unnecessary, and should under no circumstances be permitted."

The M.O.H. takes this opportunity of cordially acknowledging the willing and invaluable assistance and co-operation of Dr. J. McCrae, Ph.D., Government Analyst, and of Drs. W. A. May and J. Mitchell, respectively the late and present Government Bacteriologist, in all matters relating to the protection of food supplies.

WATER SUPPLY.

During 1908-9 568,303,300 gallons of water were supplied to consumers connected to the Council's mains. The length of mains within the Municipal area is 271 miles.

The water of Johannesburg is obtained from two sources: (1) the Rand Water Board and (2) Bore-holes, shallow wells, and drain water tanks, the private property of consumers.

I. THE RAND WATER BOARD obtain their supply from two main sources, namely, (a) Zuurbekom, and (b) Zwaartkopjes. Particulars in regard thereto were given in previous reports and are briefly as follows:—

(a). ZUURBEKOM—

Deep wells in the coal measures and dolomite at Zuurbekom. This water is pumped to the open reservoir at Paarlshoop and from there to (a) the covered reservoir at Brixton and (b) the covered reservoir at the Village Main Reef. From the latter it is pumped to the uncovered High Service Reservoir at Yeoville. Zuurbekom water is of exceptional purity and of only moderate hardness (12 parts per 100,000) but is liable to contamination by dust, locust, etc., at the uncovered reservoirs at Paarlshoop and Yeoville. While such contamination is not necessarily harmful, it renders the correct interpretation of analytical results more difficult. The use of uncovered reservoirs is to be deprecated, and the M.O.H. has on previous occasions recommended that they be roofed in.

M.O.H. 1906-9 (b). ZWAARTKOPJES—
Water Supply.

A number of shafts and bore-holes in the dolomite in the Klip River Valley, usually spoken of as Zwartkopjes, and in regard to which the Chief Engineer of the Rand Water Board has kindly supplied (24/1/10) the following particulars as to depth and construction :—

Borehole.	Depth of loam and boulders overlying dolomite.	Depth of shaft from bottom of which borehole starts.	Depth of borehole.	Depth from surface, of concrete lining, deposited in situ.	Depth of timber lining.	Depth of steel lining, if any.	Distance from vlei.	Magnetic directions of drives from shafts and lengths in feet.
A	ft. 47	ft. 15	ft. 183	ft. 15	ft. —	ft. 45	ft. 180	—
A 2	47	15	167	15	—	45	180	—
B 1	83	125	—	27	56	Not yet put in	1,500	S.W. 190
B 2	88	125	—	27	61	Not yet put in	1,500	N.W. 120
C 1	45	45	243	15	30	Not yet put in	280	—
C 2	60	63	137	15	45	85	180	—
D 1	120	120	210	15	—	Not yet put in	4,600	D 1 and D 2 connected
D 2	120	155	320	39	91	Not yet put in	4,600	S.E. 60
E 1	43	103	180	43	45	Not yet put in	4,600	N.W. 380
E 2	43	103	180	43	45	67	4,600	S.W. 260
F 1	44	67	300	Not yet put in	—	87	2,000	E. 290
F 2	60	87	170	15	—	Not yet put in	2,000	—
G 1	25	84	165	15	10	Not yet put in	150	—
G 2	35	84	165	15	42	Not yet put in	260	E. 80
H 1	50	82	210	46	14	—	2,800	—
H 2	43	127	205	43	—	—	2,900	N.E. 75
I 1	60	100	235	38	—	—	5,000	E. 36
I 2	50	90	235	51	39	Not yet put in	5,000	S. 18
K 1	30	96	130	35	30	Not yet put in	1,200	—
K 2	30	96	183	35	30	Not yet put in	1,200	—
P	65	15	—	15	—	65	1,500	—

NOTE.—Excepting at “F” the steel or timbered linings are below the concrete lining.

In forwarding these particulars, the Chief Engineer writes as follows :—

“ I should like to remark that, as you are of course aware, the nature of the soil and rock met with are likely to have quite as important a bearing on the quality of the water as the distance which intervenes between the service and the rock formation below or between the different shafts and the vlei.

“ Wherever rock has been met with near the surface, it has either been in the form of boulders, or any fissures have been choked and filled to a considerable depth by soil washed down from above. Exceptions to this rule no doubt occur on the dolomite formation ; there is one within 300 yards or so of the boreholes at “ H,” but I do not know of any other near our sources of supply. The mere presence of boulders, even of considerable dimensions, near the surface cannot, I think, facilitate the percolation of imperfectly filtered water to any greater extent than the wall of an artificial filter, or the outer surface of a driven steel lining. It may be remarked that the concrete lining of the shafts at Zwaartkopjes have all been deposited *in situ*, that is, the wet concrete has been rammed against undisturbed ground. This forms a much better protection than the method of first timbering a circular shaft and then laying concrete blocks inside the timbering, leaving the latter to decay in the course of time, and allow the earth to settle against the blocks. This method was followed at Zuurbekom.

“ None of the timber linings are intended to be permanent ; later on steel linings will be placed inside them, and the space between filled with rubble.

“ Where headings have been driven, the entire supply of water is derived from them, none is found in the shaft, at the bottom of which the headings are driven. At “ A,” “ C,” “ H₁,” “ I,” and “ K ” the water comes from the boreholes below the bottom of the shaft at an unknown depth. At “ F 1 ” the principal spring appears to be in the side of the borehole, about 85 feet from the surface.

“ The surface soil which overlies the rock is, generally speaking, the ordinary red loam usual in the district, but in and near the vlei, and in all places which are occasionally under water, this is replaced by a black loamy soil, containing a much larger proportion of clay. In the vlei itself several pits have been dug. These shew that the bottom consists mainly of clay, and that there is not, as might be supposed, any considerable proportion of light or peaty soil, formed of the remains of decaying vegetation. The impermeability of the bottom of the vlei is shewn by the fact that small embankments laid across it in order to carry the pipes, and merely deposited on the original surface soil, are effective in holding up the water to a height of several feet. This could not be the case if the ground were of a highly permeable character.”

The water from these boreholes is pumped to the open balancing tanks at Zwaartkopjes, and from these to the reservoir at Turffontein Nek, from which it gravitates to a smaller reservoir on the Village Main Reef property.

The supply to the Yeoville reservoir is pumped from the latter. At present the Low Service or Harrow Road Reservoir is disused ; in the past it has been served from the wells and boreholes in New Doornfontein, being supplied by gravitation from the High Service Reservoir.

The greater portion of the Town is supplied from the High Service or Yeoville Reservoir.

The townships of Brixton, Vrededorp, Melville, Richmond, Mayfair and Fordsburg, however, draw their supply, which is generally Zuurbekom water, from a covered reservoir at Brixton ; while the southern suburbs—Booyens, Booyens Reserve and Ophirton—are supplied direct from the Rand Water Board's main.

Up till August, 1907. Zuurbekom was the only source of supply for the High Service Reservoir, but in that month Zwaartkopjes water was brought into use and forms about six-sevenths of the daily amount pumped in. The Yeoville reservoir is uncovered and has a capacity of some 3,000,000 gallons. Owing to the proximity of the outlet to the inlet, the circulation is poor, and while some water at once escapes, there is a tendency to undue stagnation on the part of the remainder. It has previously been recommended that the relative positions of the inlet and outlet should be altered so as to obviate this.

Character of the Zwaartkopjes Water.

The character of the water from the different boreholes varies considerably, more especially in regard to total solids and hardness.

The water from three of the wells, namely, A1, A2 and G1, contains an inconveniently large proportion of iron, and, although the water is clear on issuing from the well, the iron rapidly oxidises on exposure to the air and causes the water to become discoloured. To get rid of the iron oxide which, after aeration readily deposits itself on any material with which it comes in contact, a scrubber or coarse filter has been erected at A, and appears to be answering its purpose satisfactorily. To prevent the growth of weeds which is apt to occur in waters of this description, a small quantity of copper ~~oxide~~ ^{sulphate}, about 1 part to 3,000,000, is added,

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Water Supply.
Aerated Water
and Ice
Factories.
Sewerage.

Zwaartkopjes water is considerably harder than that obtained at Zuurbekom, the degree of hardness varying, to a certain extent, with the season and position of the wells, from 20 to 40 parts per 100,000, and averages about 25. Very little is permanent hardness, and in view of the inconvenience caused to consumers it was decided to soften the water by the addition of hydrate of lime. The process is not yet in full operation, but it is hoped that efficient means of considerably reducing the hardness of the water may soon be in use.

The bacterial content of the water from the different wells at Zwaartkopjes has varied considerably, doubtless as the result on many occasions of some of the boreholes being still in the development stage.

Reference has already been made (see page 13) to a suspicious organism which was found on one occasion in the water from Borehole A, and following the exceptionally heavy rains in January, 1909, samples collected from some of the boreholes showed a higher number of organisms than was desirable. The water from these sources was cut off from the supply, and notices, etc., calling attention to the necessity for boiling all water used for drinking purposes were issued.

Pumping from the wells of Doornfontein and Braamfontein Werf has been practically discontinued for some time, but in the 4th Annual Report of the Chief Engineer of the Rand Water Board, he states that the wells at Braamfontein and the pipe lines connecting them to the water towers of Parktown are in fair condition and could, if necessary, be brought into use at short notice.

II. BOREHOLES, SHALLOW WELLS, RAIN WATER, ETC.—Judging from the results of chemical and bacterial analyses, the water obtained from boreholes in Johannesburg is as a rule of fair quality.

Shallow-well water is, however, almost without exception, bad, though this to a large measure may be due to the faulty construction or lack of construction of the wells themselves.

The quality of the rain water naturally depends on the care exercised in collecting and storing same, and in some of the outlying suburbs to which the Council's mains are not extended, it is one of the chief sources of supply. In this connection the use of rain water separators has frequently been advocated, and there is no doubt that the intelligent use of same greatly adds to the purity of the water stored.

CHEMICAL AND BACTERIAL EXAMINATIONS.

Samples are taken from the various sources of the Board's supply and at various points on the system of distribution in accordance with a carefully arranged schedule which is revised from time to time. The Water Board receives a copy of all results direct from the Government Analyst and defrays half the cost involved in collection and examination. 2,177 samples of water were taken for examination during the 3 years 1906-9, namely, 970 chemical and 1,207 bacteriological.

AERATED WATER AND ICE FACTORIES.

The Bye-laws for the regulation of these trades, which were gazetted on the 6th April, 1906, have been found to work well, but some opposition was experienced to the use of sulphuric acid as a disinfecting agent on account of its corrosive action on the metal tray in which the bottles were placed for soaking.

An excellent plan for the cleansing of dirty bottles and one which is said to minimize breakages is that adopted at Messrs. Kops and Rawling's factory.

The dirty bottles are placed in a large tank filled with solution of caustic soda. The solution in the tank is slowly heated by steam up to boiling point and then allowed to gradually cool over night. The bottles are afterwards washed in the usual way.

With a view to ascertaining the effect of storing on the organisms in aerated water, samples were purchased from the chief manufacturers in town in 1906. The results obtained on immediate examination, however, were so good that further experiment was abandoned.

SEWERAGE.

In October 1907 the main outfall sewer to the Council's sewage farm at Klipspruit was completed and brought into use; amongst the earliest connections being what was known as "the Corner House Sewerage System," which formerly drained to the Septic Tank Installation on the Robinson Mine. Following the completion of the outfall sewer, the reticulation in the south-western area was pushed on with, and is now practically finished. On the 30th June, 1909, 2286 premises had been connected and plans for an additional 202 passed.

South Eastern District.

M.O.H. 1906-9

Sewerage.

Sewer Air.

After certain preliminary work, and very largely on the initiative of Mr. Councillor Moffat, who was then Chairman of the Sewerage Committee, it was found possible to construct a subsidiary outfall sewer into which the greater portion of the Southern and Eastern suburbs could eventually be drained. This work was commenced prior to street reticulation work being taken in hand, in order that by constructing 'intakes' on this sewer, the heavy cost of carting away night-soil and waste water might be lessened. The subsidiary outfall sewer was started on the 5th June, 1908 and came into use on the 19th January, 1909. Its line is through the City & Suburban G.M. property in a southerly direction, thence along the north side of the Wemmer Pan continuing through Springfield, and thence under the Heronmere Dam to a point near the southern boundary of Ophirton, where it joins the main outfall. The total length is 21,350 feet, of which 7,793 feet are in open trench and 13,557 in tunnel. The size of the sewer is roughly 2 ft. by 3 ft.

As already mentioned three intakes for slop-water and night-soil were constructed in conjunction with this sewer, but further reference to same will be made later.

In addition to the intakes 85 premises had been connected to this subsidiary sewer at the 30th June, 1909.

House Connections.

The decision of the Council to enforce penalties provided for non-compliance with notice to connect to the sewers considerably accelerated this important work. This action was followed by a scheme for extending financial assistance to those unable to find the money necessary, but even with the facilities thus afforded a number of property holders have failed to connect. Owing, however, to the cost of maintaining the two systems of night-soil removal side by side, it became necessary to raise the fees in connection with the bucket system in the sewered area; but the new tariff which came into operation on 1st October, 1909 may again require revision, in order to induce property owners to avail themselves of the sewers.

SEWER AIR.

In view of the present extension of the sewerage system and the fact that in the near future even a larger number of premises will be connected, it is interesting to note that considerable attention has been paid of late to the effect of sewer air on health. In 1907 an instructive paper was published by Major Horrock, R.A.M.C. who, as a result of several carefully thought-out and conducted experiments, came to the conclusion that "specific bacteria present in sewer-age may be ejected into the air of ventilation pipes, inspection chambers, drains and sewers by the

- (a) bursting of bubbles at the surface of the sewerage,
- (b) separation of dry particles from the walls of pipes, chambers and sewers, and probably by
- (c) the ejection of minute droplets from falling sewerage.

Quite recently (1908) Dr. Andrews has confirmed Major Horrock's results and stated that under many ordinary circumstances characteristic sewerage bacteria are to be found in the air of drains and sewers.

Numerous scientific papers have been published in which observations supporting the above and the contrary view may be found. Without, however, reviewing at length the literature on the subject, it is interesting to note the conclusions of Professor Delépine in a special report presented to the Sewer Ventilation Committee of Manchester in 1909.

Professor Delépine's conclusions which are based on a series of experiments carried out with the air of a High Street Sewer at Manchester are confined to the effects of normal sewer air upon health and are as follow :—

1. "Taking the High Street sewer as a type of a fairly well-constructed sewer, carrying "moderately dilute domestic sewage of average composition, I have come to the conclusion "that the air of such a sewer is free from appreciable noxious properties.
2. "This conclusion is not applicable to the air of sewers where, owing to the formation of "deposits or for some other reason, the air becomes loaded with an unnecessary amount of "noxious gases which are not normally present under other conditions.
3. "It does not either apply to sewers receiving certain kinds of trade effluents or waste "products, poisonous in themselves, or liable to undergo changes or to produce compounds "dangerous to health.
4. "This conclusion does not refer to the air escaping from foul drains or pipes, which air may "be quite different from sewer air, or may contain particles of dried material not to be "found in sewer air. The air escaping from such drains may be quite different from sewer "air, and requires special study before any definite opinion can be offered as to the amount "and kind of disease that may be attributed to it."

M.O.H. 1906-9

Sewer Air.

Sewage
Disposal.

Professor Delépine adds that the results so far obtained show that in all probability the bad effects which have at various times been attributed to sewer air should have been considered as due to changes in the sewage which need not take place, or to a mixture of noxious products which may be prevented.

SEWAGE DISPOSAL.

The Main Outfall Sewer, which is some nine miles long, conducts the sewage to the Council's Farm at Klipspruit.

The Farm is 2,642 acres in extent, of which some 1,000 acres can be irrigated with sewage from the main outfall sewer by gravitation. Previous to the Farm being purchased in 1904, the Government Commission, after public inquiry and inspection of the Farm, reported in favour of the Council's proposals for dealing with the sewage, which included :—

- (1) The provision of septic tanks ;
- (2) The construction round the upper side of the irrigable area of a storm trench sufficient to carry away the maximum run-off in heavy rains from lands lying above the area ;
- (3) The leaving of a belt 600 feet wide between the irrigable area and the lower boundary of the farm, to prevent pollution of water-courses.

The Commission recommended that this belt should be kept ploughed.

The Commission considered that there was no danger of pollution from this source to any water-supply taken from the dolomite formation ; and no reason why the effluvium from the sewage farm should be of such a nature as to constitute a nuisance to the surrounding owners.

These findings were based on the assumption that the proposed works would be properly constructed and the farm adequately supervised.

The outfall sewer was completed, and crude sewage delivered at the Farm in November, 1907, being dealt with by broad irrigation. In March, 1908, however, complaints were received by the Town Engineer from Messrs. Herrington and Ainsworth, of smell nuisance from the Farm, and without going into the further history and details of the case, with which the Council are already familiar, it is only necessary to add that the matter was brought to a head by an action for damages instituted by Mr. Herrington in 1909. The case was heard before Mr. Justice Bristowe in the High Court in June, 1909, and although Mr. Herrington failed to substantiate his claim for damages, the Court granted an interdict against the Farm. The operation of the interdict was, however, suspended until the 31st May next, in order that the Council might take any action necessary to abate the nuisance.

Following on the judgment of the Court, a Joint Report on the Future Management of the Farm, was presented by the Town Engineer and the Medical Officer of Health, who submitted the following recommendations, the majority of which had been at various times previously urged on the Council :—

1. That a properly qualified and experienced Manager at a commencing salary of £500 per annum with free house and locomotion, be appointed, his duties to be defined in writing and to include :—
 - (a) The gauging and recording of the flow of sewage ;
 - (b) Keeping the statistics with regard to the areas under irrigation ;
 - (c) The keeping of meteorological and other observations ;
 - (d) The keeping of an Official Diary ;
 - (e) The control of the effluent from the Native Wash Site at Klipspruit ; and
 - (f) The responsibility for proper observations being taken during the night.
2. That the Farm be securely fenced round to prevent trespass and damage to the sewage-carriers, with consequent overflow and possible nuisance.
3. (1) That the whole of the irrigable portion of the Farm as well as those parts below the treatment area, viz., 1,580 acres, be ploughed with as little delay as possible, and thereafter re-ploughed as often as required.
 - (2) That re-ploughing be carried out to such an extent that an ample sufficiency of ploughed land is in constant readiness for the sewage to be dealt with.
4. That the 600 feet belt between the lower boundary of the land under irrigation and the lower boundary of the farm be carefully preserved and kept ploughed in such a manner as will best guard against the possibility of overflow of sewage ; and that a belt of blue gum trees, about 100 feet wide, be planted along the boundaries of the farm.

5. That during irrigation, four-fifths of the land should be at rest and one-fifth under sewage. M.O.H. 1906-7
Sewage Disposal.

This is an exceedingly important point. The farm should be divided up into at least 5 sections, numbered, and of suitable size (as indicated by experience), to each of which, on consecutive days, the sewage should be applied, the site irrigated on one day remaining at rest for the four following days. Refuse Disposal.

6. That the carriers be completed and the main carriers increased in size. The former are indicated on the plan by single dotted black lines and the mains in double dotted lines.
7. That detritus chambers and continuous sedimentation tanks be constructed without delay.
8. That outlet pipes with wooden plugs be inserted at suitable points in the carriers to facilitate effective distribution of the sewage on the land.
9. That catchwater drains be cut where shewn in blue on the accompanying plan, to prevent stormwater from the higher ground flowing over the ploughed areas.
10. That where shewn in red on the accompanying plan, intercepting drains be constructed within the sewaged area near its lower boundaries and above the 600 ft. belt, in such a manner as to receive and discharge on to reserve land any accidental overflow of sewage.
11. That in view of the finding of the Royal Commission on Sewage Disposal, 5th Report pp. 29/30, that the addition of two or three grains of lime per gallon to the tank liquor materially reduces the amount of suspended solids therein and largely destroys the offensive character of the liquor, this additional suggested safeguard against the occurrence of nuisance be tried at Klipspruit.
12. That oziers and other suitable grasses be grown, especially in the low-lying parts where there is considerable moisture, as well as such other crops as, under suitable conditions, may be considered advisable, always on the distinct understanding that the innocuous disposal of the sewage is the first essential function of the farm and is not to be made secondary to agricultural considerations.
13. That, in order to facilitate efficient future working, it should be clearly laid down that the Farm Manager is primarily responsible to the Town Engineer, and, through him, to the Sewerage Committee. Further, that the persons holding the positions of Town Engineer and Medical Officer of Health for the time being, be associated in responsibility as regards the principles and methods of sewage treatment, adopted at Klipspruit: that the M.O.H. be definitely empowered to inspect, inquire and report on the working and condition of the Farm, whenever he may deem it necessary; but that any directions or recommendations the M.O.H. may think desirable to make to the Farm Manager, be communicated to the latter through the Town Engineer.

In conclusion, the Town Engineer and M.O.H. stated that while "they believe that the adoption of the above measures, and the careful general conduct of the Farm, would minimise the smell therefrom, they desired to place it on record—as the English Commissioners have very explicitly done—that all sewage farms are liable in certain states of the atmosphere to give off unpleasant and offensive smells. All, therefore, that the Council can do in the matter is to adopt every reasonable method for reducing the liability to such occurrences."

The above works are now well in hand, and Mr. Speneer, late Sub-Inspector of the Mersey & Irwell Joint Rivers Board, who has been appointed Farm Manager, is expected to assume his duties about the middle of February.

It must, however, be clearly understood that the future management of the Sewage Farm is a matter of paramount importance to the Council, and it must be made clear to Mr. Speneer on taking up his appointment that agricultural considerations must be made secondary to the proper disposal of the sewage.

SCAVENGING.

This matter is fully dealt with in the Report of the Manager of the Scavenging Branch (Mr. F. C. Gavin, M.R.C.V.S.) and the M.O.H. has little to add to the observations at p. 56 of his last Report, except that he is strongly of opinion that services of this kind should, for general reasons of Public Health, be rendered with the highest degree of efficiency practicable, and at charges which, while fully covering outlay, do not become a source of considerable municipal revenue.

M.O.H. 1906-9

STREET SWEEPING.

Street
Sweeping.House Refuse
and Carcase
Removal.Nightsoil
Removal.Mines
Sanitation.

This is done in the night-time, except during the wet season, when it is postponed to the early morning so as to get the mud off the street just before the day's traffic commences. Some 10,182 mule loads are removed by 71 Scotch carts each month. The expenditure under this head for 1908-9 was £13,476, but, subject to financial considerations, this service might with great advantage be considerably increased.

HOUSE REFUSE AND CARCASE REMOVAL.

An average of 584 Scotch cart loads per day of house refuse are collected, and most of it now is burnt at the Destructor. A considerable extension of this service will be necessary in the near future, and the M.S.D. has been asked to make provision for same in the forthcoming estimates.

A strong and durable form of house refuse receptacle has recently been approved, and is specified and figured herewith.

Owing to the Brickfields at Doornfontein being available for the disposal of refuse, the Natal Spruit Destructor was closed down from August, 1908, to June, 1909. Depositing sites near habitations, however, usually give rise to numerous complaints, and unless the refuse can be removed beyond the outskirts of the town (which considerably increases the cost of service) it is far better that it should be dealt with at a Destructor. A Destructor for the service of the northern and north-eastern districts is badly required, and eventually one will be necessary in both the southern and north-western suburbs.

CARCASE REMOVAL.

1,853 horses and mules, 497 pigs, 7,888 dogs and 504 other carcases were removed, and either buried at the depositing sites or burned at the Destructor.

REMOVAL OF NIGHTSOIL AND DISINFECTION OF PAILS.

The average number of pails removed per night for the twelve months ending 30th June, 1909, has been 18,271. Every pail, before being sent out, is washed, tested for leakage, dipped in boiling creosote in steam-jacketed pans, and after the surplus creosote has dripped off in such a way that it is collected and available for use again, is 'nested' with other pails and placed in the carts for distribution.

The M.O.H. has nothing to add to remarks made in his last report with regard to this process; which is most effective and economical in its working.

Formerly the nightsoil was buried in shallow trenches at the Council's depositing sites, but, as was foreshadowed in a previous report, it was found possible during the period under review to abandon the depositing sites and utilise the outfall sewer by means of intakes.

Four intakes for the disposal of nightsoil are now in use, and were brought into operation as follows:—

Main Compound, Vrededorp	...	...	14th November, 1908.
Natal Spruit	...	...	19th January, 1909.
Wolhuter	...	...	26th April, 1909.
Springfield	...	...	26th May, 1909.

During the daytime these intakes and also those at the Gaol and Shanks Street are used for the disposal of slopwater.

Details of the intakes are furnished in the report of the Manager of the Scavenging Department, and it is only necessary to add that considerable improvement and saving of expenditure, both in the nightsoil service and removal of waste-water, has resulted. The scheme is similar to that which was recommended by the M.O.H. and the T.E. (then Deputy Town Engineer) in 1902, but which was not at the time adopted, as it was then hoped that the whole of the town would be sewered within two years.

The Table inset herewith shews the cost of the various services during the years 1904-9; and it will be observed that under Mr. F. C. Gavin's remarkably able administration, the 1904 deficit of £106,442 was converted into a surplus of £25,252 in 1909.

MINES SANITATION.

This matter has been closely investigated during the period under review by the M.O.H., in his capacity as Member of the Government Mining Regulations Commission. The report of this Commission will shortly be issued.

In January, 1904, the Council, on the advice of the M.O.H., appointed a special and highly qualified inspector (Mr. A. Cowie) for mine sanitation work, this being the first appointment of the kind recorded in any British mining community. Mr. Cowie has since worked

Cost of Scavenging Services 1904 to 1909.

Year ended 30th June.	Service.	Cost.	Revenue.	Surplus.	Deficit.
1904	Night Soil Service ...	105,007	115,226	10,219	—
	Refuse and Carcase ...	45,698 }	13,108	—	116,661
	Slop and Bathwater ...	84,071 }			
	TOTAL ...	234,776	128,334	—	106,442
1905	Night Soil Service ...	114,055	148,152	34,097	—
	Refuse and Carcase ...	53,587 }	16,990	—	116,008
	Slop and Bathwater ...	79,411 }			
	TOTAL ...	247,053	165,142	—	81,911
1906	Night Soil Service ...	102,031	166,126	64,095	—
	Refuse and Carcase ...	54,442 }	17,865	—	120,499
	Slop and Bathwater ...	83,922 }			
	TOTAL ...	240,395	183,991	—	56,404
1907	Night Soil Service ...	105,449	172,601	67,152	—
	Refuse and Carcase ...	52,470 }	24,866	—	110,703
	Slop and Bathwater ...	83,099 }			
	TOTAL ...	241,018	197,467	—	43,551
1908	Night Soil Service ...	77,147	178,166	101,019	—
	Refuse and Carcase ...	34,860 }	15,497	—	80,239
	Slop and Bathwater ...	60,876 }			
	TOTAL ...	172,883	193,663	20,780	—
1909	Night Soil Service ...	73,264	161,045	87,781	—
	Refuse and Carcase ...	25,946 }	9,222	—	16,724 }
	Slop and Bathwater ...	47,961 }	2,156	—	45,805 }
	TOTAL ...	147,171	172,423	25,252	—

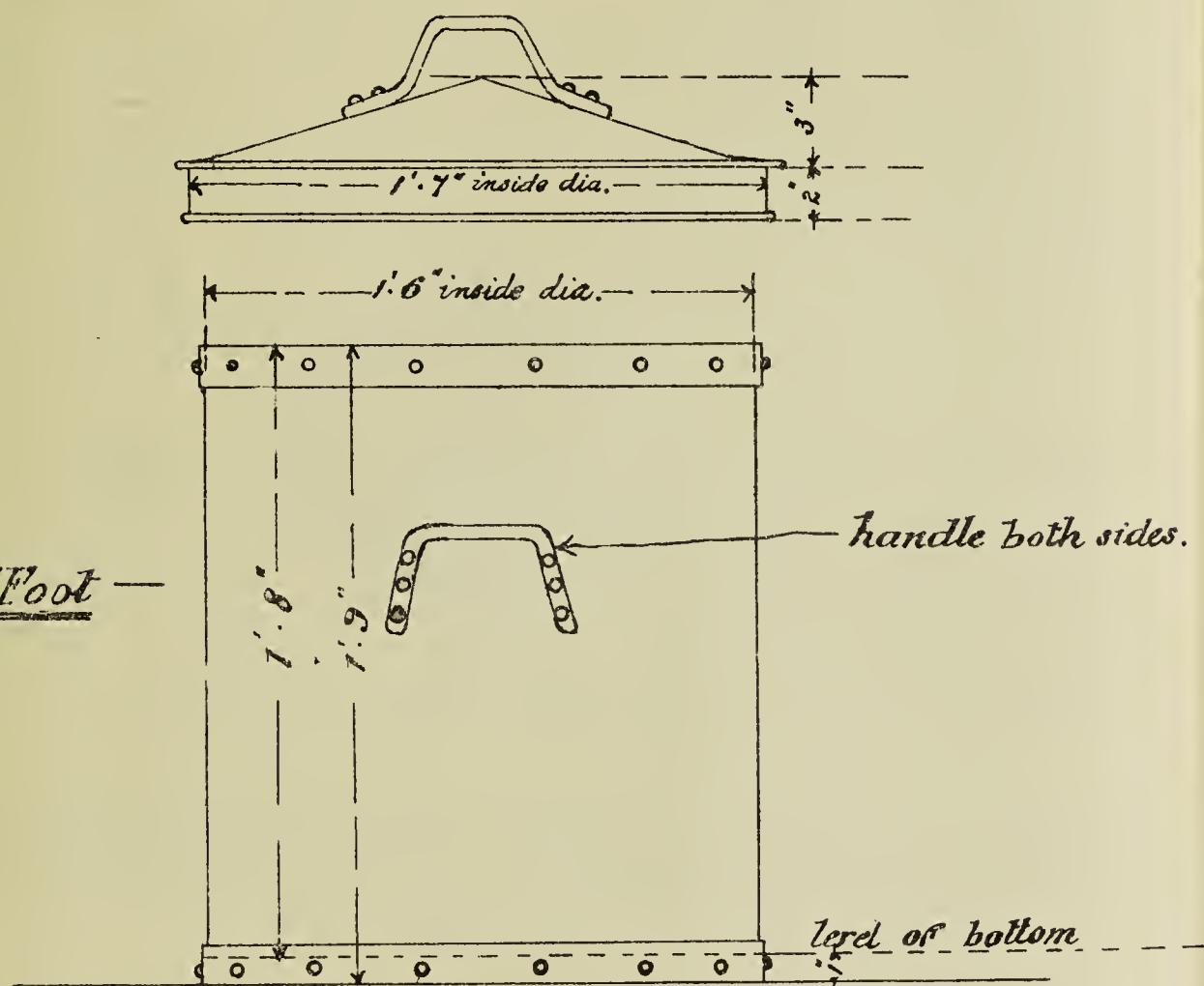




Municipal Council of Johannesburg.

PUBLIC HEALTH DEPARTMENT.

Drawing and Specification of Portable Dust Bin with Cover.



Specification.

The body of the bin to be made of 16 gauge galvanized iron, and to the dimensions shewn on the drawing; to have a single rivetted lap seam; and to be stiffened at top and bottom by bands of W.I., $1\frac{1}{2} \times \frac{1}{8}$ ", rivetted to the side and bottom by $\frac{1}{4}$ " rivets not more than 4" pitch. The top edge to be neatly dressed over the W.I. band, and the bottom piece to have a turn down of at least $\frac{3}{8}$ ". The bottom of the bin to be sufficiently perforated to prevent storage of liquids, but so as not to cause any undue weakening of the bottom piece. Two $\frac{1}{2}$ " diam. W.I. handles to be provided, one on each side, and each securely fixed by six $\frac{1}{4}$ " rivets, and provided with stiffening straps inside.

The lid to be cone-shaped as shewn, of 16 gauge galvanized iron, and made to fit outside the edge of bin with about $\frac{1}{8}$ " clear play all round. The rim to be 2" deep, wired on bottom edge with $\frac{1}{4}$ " iron, and the top to be flanged and securely clinched to edge of cover. The handle to be of $\frac{1}{2}$ " diam. W.I., securely fixed to lid by four $\frac{1}{4}$ " rivets, and provided with stiffening straps inside.

Note: The whole of the Bin to be made of black iron and galvanized in one piece on completion.

February, 1910.



tactfully and steadily, and various witnesses before the Mining Regulations Commission M.O.H. 1906-9
 testified to the excellent and beneficial character of his work and to its share in the reduction Mines
Sanitation.
 of the death rate amongst native miners. On matters relating to surface sanitation, Mr. Cowie reports directly to the M.O.H., Johannesburg. As regards underground sanitation, he works, by arrangement agreeable to the mines and all concerned, as an official of the Mines Department, and reports to the Government Mining Engineer, who transmits a copy to the M.O.H., Johannesburg. A copy of every report is sent to the Chamber of Mines, the Mine Manager and Doctor, the Native Affairs Department and the High Commissioner.

In January, 1909, Mr. R. Beattie, a district inspector in this department, was appointed Assistant Mines Sanitation Inspector, and in collaboration with Mr. Cowie is doing excellent work.

Attached is the Mine Sanitation Inspector's report for 1906-7-8-9 :—

30th October, 1909.

In accordance with your instructions, I beg to submit the following general statement regarding the work of Mines Sanitation Inspection within the Municipal area of Johannesburg :—

SURFACE SANITATION.—In addition to special investigations and reports called for from time to time by the M.O.H., and the Assistant M.O.H., with regard to the sanitary condition of the mining district, periodical inspections are systematically made of the surface sanitary arrangements and conditions prevailing at each mine, with a view to ascertaining the existence of any nuisances or defects in connection therewith. Detail reports are furnished to the M.O.H. as to (a) the sanitary conditions and repair of all native compounds, locations, hospitals, works, and married and single white quarters ; (b) drainage, disposal of refuse, and general scavenging ; (c) water supply ; and (d) condition of all licensed premises such as dairies, cowsheds, butchers' shops, mine boarding houses, and Kaffir eating houses. Notices are served on the mine managers calling upon them to remedy or abate any sanitary defects or nuisances dealt with in the reports, and reinspections are made to see to the due execution of any works which may be found necessary in order to fulfil the requirements of the notices ; any undue delay or failure to suppress or remove any nuisances being reported to the M.O.H. for further action. The fact that mine managers recognise the importance of establishing good sanitary conditions is fully evinced by the ready compliance with which, invariably, all reasonable demands of the Public Health Department are met, and the appointment of competent white men to constantly supervise and control the work of the native scavengers on the surface.

Undoubtedly the housing accommodation on the mines has been steadily improving of late, and the surface sanitary conditions generally, within the district, can be said to be satisfactory.

UNDERGROUND SANITATION.—Regular inspections continue to be made of the underground sanitary conditions at each mine, and detail reports thereanent are furnished to the M.O.H. and the Inspector of Mines. The following general requirements are called for, namely (a) a sufficient number of suitable sanitary conveniences in well ventilated and conveniently accessible positions ; (b) constant and careful supervision of the work of the native scavengers by capable and energetic white men, so as to ensure cleanliness at and about the latrines, and freedom from nuisance throughout the mine generally ; (c) proper and sufficient use of suitable disinfectants ; (d) periodical linewashing of the face of the rock at shaft stations and frequent sweeping and disinfecting of station floors ; (e) the prevention of nuisance by stagnant water in the drives and cross-cuts ; (f) the advisability of employees, both white and native, being periodically warned against drinking mine water, and depositing excreta anywhere underground except at the latrines provided. The removal and disposal of night-soil when brought to the surface, and the cleaning and disinfecting of the sanitary buckets are matters which are well and carefully attended to by the Municipal Scavenging Department.

With reference to the collection and removal of night-soil underground, it is recognised that a distinct sanitary improvement would be effected if the sanitary buckets were provided with close fitting air-tight covers so as to prevent nuisance arising from spillage and smells, while the full buckets are being conveyed by hand from the latrines to the shaft stations and afterwards in the cage or skip to the surface. This matter of providing lids was closely gone into about the beginning of last year by the Assistant M.O.H. and the Manager of the Scavenging Department, and an experiment made at one of the mines in the district.

Considering the obstacles which stand in the way of readily securing the same satisfactory measure of cleanliness underground as can be obtained on the surface, it is pleasing to be able to state that, by the increasing efficiency of sanitary supervision and control provided by the mines, and the growing tendency amongst the white miners themselves to realise the importance of sanitary precautions underground, and to report any nuisances discovered by them. The standard of underground sanitation within the district is slowly but surely improving year by year. More attention, however, is still required on the part of the Mine Authorities towards providing properly organised scavenging arrangements, and the enforcement of the observance of sanitary rules and habits by their employees.

Owing to the work of sanitary inspection on the mines having increased considerably of late by the opening up of new properties and the greater activity in underground development, Mr. R. Beattie was appointed last year as Assistant Mines Sanitation Inspector. As a result of this appointment, the necessity for more frequent inspections being made both underground and on the surface can now be met. Inspector Beattie has energetically and faithfully taken up his new duties, and his able assistance has resulted in much good work being accomplished.

I have again to put on record the unfailing assistance and encouragement which all mine managers in the district have extended to your inspectors in the discharge of their duties.

I have the honour to be

Sir,

Your Obedient Servant,

ALEXANDER COWIE,

Mines Sanitation Inspector.

M.O.H. 1906-9

Mines
Sanitation.Government
Schools.Licensed
Places.

Towards the end of the year 1908-9, the M.O.H. had occasion to make strong representation as to the unsatisfactory state, structurally and otherwise, of the Native Compound at the New Goch Mine. It is most satisfactory to record that, although the property in question is not one of the most prosperous, these representations were met in a very friendly and reasonable manner by Mr. George Albu and by the manager (Mr. Bulman), and the compound is now in quite a creditable condition. There is, indeed, as regards mining property, little or nothing of the opposition to necessary improvement with which health officers in English towns are often only too familiar.

GOVERNMENT SCHOOLS.

In the middle of December, 1905, the M.O.H. personally inspected and reported on all Government Schools (19 in number) within the Municipality in consequence of statements as to their overcrowded and insanitary condition. The matter was brought to the notice of the Director of Education (J. E. Adamson, Esq.), and steps were at once taken to place matters on a better footing. In January, 1908, the first elected school board met, and pursuant to their request the M.O.H., after personally visiting each of the 50 Government Elementary Schools within the Municipal area, presented a detailed report on same in May, 1908.

Overcrowding then was found to be practically non-existent, and apart from schools for coloured children, the only institutions which remained open to serious criticism were the temporary City and Suburban premises, Irene School, Union Ground School, one class-room in Von Brandis School, the Jewish School in De Villiers Street and the Langlaagte Schools.

Fine buildings have since replaced the temporary City and Suburban premises and the new school in Hol Street now takes the scholars from Irene, the Union Ground and Von Brandis Schools.

The Board have also erected new schools at Yeoville, Rosebank and Vrededorp ; and the M.O.H. ventures to think that the highest credit is due to Mr. Adamson and his officers of the Education Department for the great improvement which has taken place in the school accommodation generally.

In November, 1908, the M.O.H. was appointed Honorary Medical Officer to the Witwatersrand Central School Board, and has from time to time had the privilege of advising the Board on various important matters.

It is satisfactory to record that on 14th August, 1908, on the advice of the M.O.H., and after carefully investigating the matter, the School Board decided that "ventilation being of vital importance in all school buildings, we recommend that the 'pavilion type' be adopted as 'the standard type in the Witwatersrand Central Area.'" The 'pavilion' or 'Staffordshire' type is, of course, that associated with the name of Dr. Geo. Reid, County M.O.H., Staffordshire.

Owing to the plans of certain new schools having been already sanctioned and money allotted therefor, effect could not at once be given to this resolution. But the Chief Architect of the Public Works Department (Mr. P. Eagle) accepted it, and in the light of present knowledge as to school construction, it is doubtful whether any material improvement could be effected in his remarkably excellent recent designs.

As regards the prevention of infectious disease in schools, instructions as to grounds and periods of exclusion of infected children have been issued from time to time to school-principals, and the work of the Health Department in this respect has been much assisted by the very prompt and intelligent assistance they invariably accord. On many occasions during the three years under notice, school closure has been necessary, and has been followed in every case by careful disinfection of school buildings.

LICENSED PLACES.

From 1st July, 1906, to 30th June, 1909, 6,943 applications for licences of various kinds have been dealt with, the premises in question being in all cases carefully examined as to sanitary requirements.

	1909.		Total.
	Granted.	Refused.	
1. Tea Shops, Eating Houses, Restaurants, etc.	588	38	626
2. Dairies	411	20	431
3. Butchers' Shops	379	17	396
4. Bakers	99	10	109
5. Kaffir Eating Houses	125	37	162
6. Slaughter Houses	17	—	17
7. Laundries	64	25	89
8. Ice Creameries	118	2	120
9. Noxious or Offensive Trades	63	8	71
10. Asiatic Eating Houses	3	1	4
11. Aerated Water Factory	28	1	29
12. Hairdressers and Barbers	225	11	236
Totals	2,120	170	2,290

LOCATIONS.

M.O.H. 1906-9

Locations.

The M.O.H. does not interfere in the work of the Locations, except where his advice is sought by the Superintendent. From time to time, however, the M.O.H. is called on for reports on special matters.

Veterinary Branch.

Extra-Municipal Work.

Expenditure.

THE KAFFIR LOCATION AT KLIPSPRUIT.—Owing mainly, it is believed, to its distance from town and the time occupied by the railway journey to and fro, this location has not proved, financially or otherwise, the success which its promoters expected it to be. Other arrangements are therefore, in contemplation.

INDIAN OR MALAY LOCATION.—It is no secret that the sanitary condition of this location is far from satisfactory. An improved house-refuse removal service is in course of institution, and a sanitary inspector and a rat-catcher have been detailed for exclusive duty here. But much more costly provision in the nature of water-main reticulation, sewerage, lighting and road-making is essential to bring this locality up to a reasonable standard of safety and comfort, especially in view of the constant possibility of plague re-appearing here. The Council's difficulty in the matter is, however, great. Half, at least, of the area belongs to the Railway Administration, who expect to utilize it "within the next 10 years" for goods sidings, stores etc. Costly work on the above indicated necessary improvements, would obviously then become useless. Further, the remaining portion of the location would be too small, and a new site would have to be sought.

The M.O.H. thinks that the difficulty might be removed if the Council could re-acquire possession of the railway area, which was theirs previous to October, 1906.

VETERINARY BRANCH.

In August, 1907, Mr. James Irvine Smith, M.R.C.V.S., was appointed Municipal Veterinary Surgeon. His administration has resulted in large economies averaging £7,000 per annum, with very marked efficiency. The price of shoeing has been reduced to 4s. 3d. per animal per month, and in addition the Council now makes all its own shoes, and gives employment to a number of white farrier apprentices.

The Municipal Veterinary Surgeon has organized and is Superintendent of the fine and remunerative Municipal Cattle Markets, and will be Director of the new Abattoirs now approaching completion.

EXTRA-MUNICIPAL WORK OF M.O.H.

With the sanction of the Council, the M.O.H. has shared in the prolonged and laborious but very interesting work of the Mining Regulations Commission, whose reference included all matters of mine sanitation in its widest sense.

During leave of absence in 1908-9, the M.O.H. inspected various abattoirs, sewage works, water-purification plants, prisons, mines, food-canning works etc., in South America, England and Germany, as well as in Cairo and Alexandria, and obtained much useful information.

EXPENDITURE OF PUBLIC HEALTH DEPARTMENT.

(This does not include Scavenging Expenditure.)

	1906-7.	1907-8.	1908-9.
Salaries	£14,973 15 8	£12,185 9 2	£12,020 0 0
Native Wages, Food and Passes	456 18 2	339 17 4	249 0 0
Locomotion	869 8 4	573 5 0	531 0 0
Miscellaneous Expenses	3,165 0 11	3,319 0 0	2,429 0 0
Cartage	—	396 10 10	320 0 0
Isolation Hospital	1,479 18 5	1,027 6 0	1,189 0 0
Disinfecting Station	434 11 5	213 14 8	231 0 0
Plague Expenditure	306 14 0	249 17 0	239 0 0
Rents, Rates and Insurance	67 11 10	83 6 9	150 0 0
Depreciation	55 10 9	41 13 4	54 0 0
Municipal Offices	402 0 6	187 8 9	379 0 0
Sundry Expenditure	76 1 5	113 17 11	—
	£19,287 11 5	£18,731 6 9	£17,791 0 0

M.O.H. 1906-9

PROSECUTIONS.

Prosecutions.
Staff.

1,013 persons were prosecuted for various breaches of the Sanitary Regulations ; 945 were convicted, and fines aggregating £2,091 6s. were imposed. Particulars are appended :—

BY-LAWS INFRINGED.	Race of Accused.			Totals.
	Whites.	S. A. Coloured.	Asiatics.	
Prevention of Nuisances ...	362	59	42	463
Infectious Disease	1	—	—	1
Sale of Food and Drugs ...	124	—	11	135
Dairies and Milkshops ...	42	—	4	46
Bakehouses	7	—	—	7
Eating-houses	4	—	—	4
Slaughter-house, etc. ..	—	—	—	—
Washing and Laundries ...	—	—	5	5
Kaffir Eating-houses ..	13	10	1	24
Aerated Water Factories ...	1	—	2	3
Asiatic Tea Rooms	—	—	4	4
Barbers' Shops	1	—	—	1
Native Location	—	320	—	320
TOTALS ...	555	389	69	1,013
RESULTS—				
Convicted and Fined ...	463	285	58	806
Convicted and Cautioned ...	65	71	3	139
Dismissed	27	33	7	67
Charge Withdrawn	—	—	1	1
AMOUNT OF FINES ...	£1,699 13 6	£243 17 6	£147 15s.	£2,091 6s.

This work was closely supervised by the M.O.H., under whose personal direction the proofs of evidence, summonses, subpoenas, indictments and charge sheets are prepared and handed to the Assistant Public Prosecutor in the Magistrate's Court.

Important prosecutions are conducted by the Council's solicitors, Messrs. Lance & Hoyle, to whose courtesy and help the M.O.H. is much indebted

STAFF OF PUBLIC HEALTH DEPARTMENT.

A.—INSPECTORS. The following statement shows the number of Sanitary Inspectors employed during the year under notice as compared with the number before the war :—

	Before War.	1904-6.	1906-9.
Chief Inspector	1	1	1
District Inspectors	16	17	14
Native Constables with District Inspectors	16	3	2
Special Service Inspector	1	—	—
Mines Sanitation Inspector	—	1	2
Infectious Disease Inspector	—	2	2
Disinfecting Inspector	—	1	1
Licensing Inspector	1	1	—
Food Inspectors	2	1	1
Frozen Meat Inspector at Kazerne	—	1	1
Slaughterhouse Inspector	1	1	1

Of the 22 white Inspectors, 19 possess the certificate of the Royal Sanitary Institute.

It is further to be noted that since the British Occupation 28,070 plans of new houses were approved to 30th June, 1909, and that the area of supervision during 1904-6 included Berea, Yeoville, Bellevue, Bellevue East, Lorentzville, Judith's Paarl and Jeppestown Extension districts, besides the numerous Townships and Mines included within the Municipality as the result of the Extension Scheme sanctioned by Ordinance 13 of 1902, and 36 of 1903.

II.—NUMBER AND DISTRICTS OF DISTRICT SANITARY INSPECTORS.—There are fourteen District Sanitary Inspectors, whose districts are as follow :—

No. of District.	Townships included in Districts.	No. of Houses in District.	No. of Licensed Places.
1	Fordsburg, Burghersdorp and Newtown	1,836	144
2	City and Suburban, Marshalls and Ferreiras, between Mine Fence and Marshall Street... ..	1,864 and 150 Stores & Stables	53
3	City and Suburban, Marshalls and Ferreiras, between Marshall and Commissioner Streets	1,340	103
4	Johannesburg, between Commissioner and Pritchard Streets on south and north, and End and Alexander Streets on east and west	1,055	226
5	Johannesburg, between Pritchard and Noord Streets and between Kazerne and End Streets	1,500	155
6	Braamfontein to Hospital Hill, Parktown and Forest Town	1,604	85
7	Hillbrow, Berea, Yeoville, Bellevue, Observatory, and part Houghton Estate	1,300	31
8	Old and New Doornfontein and District between Twist and End Streets	1,700	50
9	Troyeville, Kensington, Bertrams, Lorentzville, Judith Paarl, Bezuidenhout Valley and Highlands	2,190	66
10	Jeppes, Fairview and Wolhuter	2,013	17
11	Belgravia, Jeppes Extension, Malvern, Denver, Cleveland and New Heriot	1,200	102
12	Vrededorp, Malay Location, Mayfair, Paarlshoop, Langlaagte and Brixton	2,677	90
		Native Constable provided in Malay Location,	
13	"Northern Suburbs"—from Claremont on West, through Auckland Park and Parktown North and Rosebank to Riviera, Houghton, Oaklands, Melville, Orchards, etc.	1,200	98
14	"Southern Suburbs"—all Townships south of Mines	1,848	214

Special Difficulties of Sanitary Inspection in Johannesburg.

In connection with the duties of the District Sanitary Inspectors, the M.O.H. would point out that the absence of any sewerage system and the state of general disrepair of street gutters, throw upon these officials an amount of work and frequently of odium that is quite unknown in English towns. Practically every house in the urbanized portion of Johannesburg has a drain in the yard which leads direct to the gutter and is put there specially for that purpose.

It will be seen from the foregoing table that the number of premises to be supervised by each inspector in the urban portion of Johannesburg varies from 1,300 with 31 licensed places in District No. 7, to 2,190 with 66 licensed places in District No. 9. Now, the average number of premises which an inspector of energy and intelligence can visit in one day—if uninterrupted—is probably not more than 40 or 50, though, of course, the number will vary with the general nature of the premises, the defects to be pointed out and explained, and the time the inspector is kept waiting to see the responsible person, which often means another visit. The M.O.H. has, during the past 20 years, done much inspection of this kind personally, and has often spent half an hour or more on one premises without wasting time. Strange, therefore, as it may possibly seem to those whose work has not included this experience, he considers that a fairly continuous record of 40 premises inspected per day is a very good one, and one which it may be quite impossible to attain, *e.g.*, when an inspector is frequently called off to attend to complaints, interview owners, serve notices and court-warnings, visit infected premises, etc., etc.

M.O.H. 1906-9

Staff.

If, however, the average daily number of places an inspector can visit be taken at 50, it will be seen that eleven full working days per fortnight, it will take him—say in the case of district No. 8, Doornfontein, etc.—more than three fortnights or from six to seven weeks to get through his district once, assuming that he devotes the greater portion of his time to nothing else but house-to-house inspection. All, therefore, that an inspector can do—and all that is attempted elsewhere—is to exercise a general supervision, making as much house-to-house inspection as he can, and prosecuting where he finds conditions necessitating this course. Excluding the two inspectors for the semi-rural northern and southern suburbs, there are twelve inspectors for urbanised Johannesburg; but, as one or other of these is frequently away on leave, the effective number is usually only 11 with two native constables, in comparison with 17 district inspectors and 16 native constables before the war, for an area that did not even include Berea, Yeoville, Bellevue East, Judith Paarl and Jeppes Extension. Since June, 1901, nearly 25,000 plans for new buildings have been passed, and the present population of Johannesburg is probably in or about 200,000.

Clearly, these are facts which should be considered before concluding, because individual yards are untidy or littered with rubbish, or because certain closets are undoubtedly unclean in courts occupied by persons of filthy habits—conditions which may arise within a few hours of an inspector's visit—that an inspector is necessarily gravely and culpably neglecting his district. On the other hand, the M.O.H. is quite aware that this very difficulty in proving neglect opens the door to slackness: and believes that a righteous judgment of the character of an inspector's work must be based on adequate knowledge of his qualifications and personality, of his difficulties, and of the general manner in which his district is kept, having regard to all the circumstances.

In the past, with a desire to meet the urgent demand for departmental economy, the M.O.H. has reduced the inspectorial staff to the lowest limits which he considered compatible with reasonable efficiency, but has strenuously resisted further reduction. He would point out that at present the ratio of district inspectors to population in Johannesburg is practically the same as in London, where the conditions of life are settled, where water-carriage exists, where there are no natives, nor Indians, nor half-castes, requiring special supervision and permits, no Kaffir eating houses, and proportionately much fewer licensed places to be regulated. The M.O.H., therefore, wishes to make it clear that if his staff is to be held responsible for the condition of every yard, when, as already shown, the complement of inspectors is only sufficient to visit each premises rather less often than once in six weeks, this staff must be very greatly increased. Personally, however, the M.O.H. does not recommend any such measure at present, though it might be necessary under circumstances such as a campaign against rats in the presence of plague. With a considerable knowledge of Johannesburg and various other cities, he considers that, while there will long be obvious room for improvement and greater effort, Johannesburg is fairly well supervised, having regard to the mixed nature of the population and the great difficulties of refuse disposal due to the fact that the major part of the town is unsewered. The exception to this statement regarding supervision is the Malay Location. For that district the employment of an additional inspector and of a ratcatcher has recently been sanctioned.

The M.O.H. regrets the continued frequency of unreasonable or greatly exaggerated complaints, and of the attempts that are made, for private reasons, to make catspaws of the officials of the Department.

A.—Mr. Thomas Manion continues efficiently to carry out the duties of Chief Sanitary Inspector, and the District Inspectors have, on the whole, worked reliably and well. The experience of Mr. A. Cowie, Mines Sanitation Inspector, in regard to domestic disposal of sewage has from time to time been utilized in the preparation of reports on unsatisfactory purification installations, and he has again prepared the charts and diagrams in this report. Mr. Crothall, Drainage and Special Building Plan Inspector, has very satisfactorily performed an increasing amount of this work.

During the three official years 1906-9, no less than 9848 written notices were served by the Inspectors in the course of their work.

B.—CLERICAL STAFF.—There has been no change in the staff, which consists of a chief clerk (Mr. F. Thompson), a typist-correspondent, a licensing clerk and an office boy. Apart from the usual statistical records of such an office (which in Johannesburg are laboriously increased by the necessity of differentiating between Whites, South African Coloured and Asiatics), and attending to the complaints of a very sensitive public, no less than 9,124 letters—not including circulars and formal acknowledgements—were written during 1908-9. In addition, the whole of the clerical work required in connection with 6,943 applications for trading licences and with 1,013 prosecutions undertaken by the Department, has been dealt with. The office staff has again worked thoroughly well, and the M.O.H. wishes to record his warm appreciation of their willing and effective assistance.

IMPORTANT MATTERS REQUIRING SPECIAL ATTENTION.

M. O. H. 1906-9

In concluding this Report, the M.O.H. begs to direct the Council's special attention to the following important matters, which should be dealt with as promptly as possible :—

Important
matters re-
quiring
special atten-
tion.

1. The ending or mending of the Malay Location. This is a very urgent question in view of the constant possibility of the re-importation of Plague.
2. The extension of the water-carriage system of sewage disposal. The outfall sewer and reticulations have cost a capital sum of £385,000, upon which interest has to be paid. Apart, therefore, from the postponement of the better health conditions which efficient water carriage connotes, the continuance in the reticulated areas of the costly and objectionable bucket system is a very unsound financial proposition, and is comparable to delivering water to houses by means of water carts after watermains have been provided.
3. The necessity for effective power to prevent uncleanly and otherwise unsuitable persons from engaging in the milk trade, and for preventing the dumping in Johannesburg of adulterated milk from outside districts.

CHARLES PORTER, M.D., M.R.C.S., D.P.H.,

Barrister-at-Law,

Medical Officer of Health.

28th February, 1910.

MUNICIPAL COUNCIL OF JOHANNESBURG.
PUBLIC HEALTH DEPARTMENT

MEASLES.

1. Attention is directed to the prevalence of Measles in the town. Measles is popularly looked upon as a trifling disease, but this is a serious mistake. It is a disease which is especially dangerous to very young children and the longer the malady can be warded off in childhood the greater are the chances of recovery. **COMMUNICATION WITH INFECTED HOUSES OR PERSONS SHOULD BE CAREFULLY AVOIDED.**

2. **HOW TO RECOGNISE MEASLES :**

It begins with the signs of a bad cold in the head—a hard cough, running at the nose, sneezing and tender and watery eyes. The rash appears first on the face and spreads from it to other parts of the body. It consists of red blotches and the face looks swollen. It seldom appears until three or four days after the first symptoms of cold in the head, **BUT THE DISEASE IS VERY INFECTIOUS FROM THE BEGINNING.**

3. **PRECAUTIONS TO BE ADOPTED :**

(a) Medical aid should be called in at once, but meanwhile all other children in the house who are well should be kept out of the sick room. On no account are they to be sent to school.

The patient should, as far as possible, be isolated from the rest of the family in a room from which all carpets, curtains and other unnecessary articles of furniture have been removed.

A sheet kept damp with some disinfectant, e.g. Cyllin—1 table-spoonful to 1 gallon of water—should be hung outside the door.

(b) If the Mother acts as nurse she should associate as little as possible with the other members of the household. She should wear a linen overall when in the sick room and should wash her hands before leaving the room.

(c) When a child at any house is suffering from Measles, no neighbour's child and no neighbour accompanied by a child must be admitted, nor should the child ill with Measles be allowed to play with other children for a month after the appearance of the rash.

(d) During the illness, and when the patient is convalescing, **GREAT CARE MUST BE TAKEN TO AVOID EXPOSURE TO COLD, AS MANY CHILDREN DIE FROM CROUP, BRONCHITIS, OR INFLAMMATION OF THE LUNGS CONTRACTED WHILE RECOVERING FROM MEASLES.**

4. **SPREAD OF INFECTION :**

It should be remembered that **ALL CASES, HOWEVER MILD, ARE CAPABLE OF SPREADING INFECTION** and that a severe case may be the result of contact with a mild one ; therefore precautions must be observed in all cases.

5. **BEFORE THE CHILD ATTACKED RETURNS TO SCHOOL THE FOLLOWING MEASURES SHOULD BE CARRIED OUT.** All articles of clothing worn by the sick child, and the bedding and hangings of the sick room should be washed. The ceiling and walls of the room, if papered, should be thoroughly sprayed brushed or washed, with a disinfectant solution, e.g. Cyllin—1 table-spoonful to a gallon. The floor should be well scrubbed. The window should be left open for several days, and the window curtains removed so as to admit as much light as possible. The skin of the child who has been ill should be thoroughly cleansed by several washings with soap and warm water.

6. **CHILDREN LIVING IN INFECTED HOUSES OR RECOVERING FROM THE DISEASE MUST NOT MIX WITH OTHER CHILDREN UNTIL AFTER RECOVERY, NOR ATTEND SCHOOL without a medical certificate.**

7. **THE LAW ABOUT MEASLES AND OTHER INFECTIOUS DISEASES :**

(a) Any person who while suffering from Measles or other Infectious Disease wilfully exposes himself without proper precautions against spreading the said disease in any street, shop, hotel, public place, etc., or

(b) Being in charge of any person so suffering or exposes such sufferer, or

(c) Who gives, lends, sells, pawns, transmits, removes or exposes or permits to be washed without previous disinfection any bedding, clothing or other things which have been exposed to infection, **RENDERS HIMSELF LIABLE TO A PENALTY NOT EXCEEDING £25.**

(d) Every parent or person having care or charge of a child, who is or has been suffering from any infectious disease or resides in the house where such disease exists, and permits such child to attend school, without producing a certificate from the Medical Officer of Health is liable to a penalty not exceeding £5.

By order of the PUBLIC HEALTH COMMITTEE,

CHARLES PORTER, M.D.,

Medical Officer of Health.

September, 1908.

REPORT

ON THE

HEALTH OF THE NATIVES AND INDIANS EMPLOYED BY THE COUNCIL

for the Years July 1st, 1906—June 30th, 1908.

M.O.H. 1906-9

Health of
Coloured
Employés.

The average number of natives employed by the Council, as computed from the returns received from the various Departments was 4,735 during 1906-7, and 3,591 in 1907-8. Considerable difficulty was experienced in ascertaining the total number employed. As the figures are not considered to be accurate, they are omitted together with any statistics based thereon. It is probable, however, that there was an increase during 1906-7 as compared with the preceding year.

The subjoined table shows the average number of natives and Indians employed by each Department :—

Department.	1906-7.		1907-8.	
	Natives.	Indians.	Natives.	Indians.
Sanitary	2,440	—	2,068	—
Town Engineer	1,104	4	529	—
Light and Power	424	—	364	—
Tramways	338	—	238	—
Water	295	—	176	—
Parks and Estates	36	132	19	95
Other Departments	96	1	102	—
Totals	4,735	137	3,496	95

The total number of admissions to hospital was 555 during 1906-7 and 572 during 1907-8, while the total deaths for the same periods were 66 and 44 respectively.

The admissions represent an annual ratio of 117·2 and 163·6 per 1,000 of the average number employed. In 1905-6 the admission ratio was 112·6.

The Annual Death-rate per 1,000, calculated on the average number employed, was 11·8 in 1906-7 and 12·8 in 1907-8.

These figures show a slight increase over the two preceding years and are mainly due to (1) the prevalence of Enteric Fever amongst the scavenging natives at the Concordia and Rosherville Compounds, and (2) the larger number of deaths from accidents and injuries during 1907-8. In fact, in 1907-8 the “accident” death-rate rose to 2·5 per 1,000, the figure for 1906-7 being only 0·17 per 1,000. The reasons for this increase are referred to later (*vide* p. 67).

The annual death-rate amongst the native labourers of the mines of the Transvaal, with an average monthly population in 1906-7 of 122,782, as calculated from the quarterly mortality returns published in the *Government Gazette*, was 32·6. In 1907-8, with a higher average monthly population, the rate was approximately 30·8.

Year.	Admissions.		Mortality.			Annual death rate per 1,000 amongst black labourers on the mines.	
	Total.	Ratio per 1,000	Deaths.	Rate per 1,000, all causes.	Rates per 1,000 from disease only.	Rate per 1,000, all causes.	Rate per 1,000 from disease only.
1906-7 ...	555	117·2	66	11·8	11·6	32·6	28·3
1907-8 ...	572	163·6	44	12·8	10·3	30·8	26·7

M.O.H. 1906-9

Health of
Coloured
Employés

The lower mortality of the Municipal as compared with the Mine native, probably was due chiefly to two factors, viz.:—(1) The better physique of the former, who are mostly Basutos or Bacas, as compared with the Portuguese natives, who form the large bulk of the Mine labourers. (Moreover, the East Coast or Portuguese natives are frequently debilitated from malaria, or the harbourers of numerous parasites), and (2) to the nature of the work on which the natives are employed, the Municipal native working in the open air, the Mine labourer underground.

Injuries, Enteric Fever, Pneumonia and Influenza are responsible for the greatest number of admissions, and Enteric and Pneumonia for the greatest number of deaths. In 1906-7, Enteric Fever caused over 40 per cent. of the total mortality.

The appended chart shows the weekly number of admissions into the Native Hospital, and while the curve is subjected to considerable variations, it shows two more or less well-marked rises, the first during the winter months, or Pneumonia "season," the second in the hot weather, due to the admissions for Enteric Fever.

Malingering has been more common than in former years, the work of digging nightsoil trenches apparently being especially repugnant.

Cases of Minor Ailments and Injuries have, as in former years, been treated at the Dispensary, while the more serious are admitted into the Compound Hospital. The reasons for their admission and their disposal are shown in the attached tables.

I. GENERAL DISEASES.

I. ERUPTIVE FEVERS caused during 1906-7, 159 admissions with 30 deaths. These figures are more than double those for the previous year. The increase was due to an epidemic of influenza during the colder months, and the large number of cases of Enteric Fever at the Rosherville and Concordia Compounds. The admissions comprised 1 case of Cerebro-Spinal Fever, 5 of Chickenpox, 10 of Measles, 61 of Influenza, and 82 of Enteric Fever.

In 1907-8 the admissions under this heading fell to 107, the reduction being due to fewer cases of Enteric Fever and Influenza.

The admissions comprised 1 case of Cerebro-Spinal Meningitis, 9 of Chickenpox, 6 of Measles, 40 of Influenza, 1 of Erysipelas, and 50 of Enteric Fever.

Cerebro-Spinal Fever.—After complete absence of the disease from the Municipal Compounds for over three years, one native was admitted from the Compound at the Burgersdorp Destructor on March 9th, 1907, and died the same day. The second case came from the Main Compound, and when discovered on May 13th, 1908, was at once sent to Rietfontein, where he died within 48 hours. Though careful enquiries were made no source of infection could be traced in either case, but as a precautionary measure the Compound rooms, together with their occupants and clothing, were disinfected, the contacts being kept under observation for three weeks. No further cases occurred, a matter for congratulation in view of the terrible mortality usually attaching to this disease.

Chickenpox.—Although over 1,900 cases were reported during the two years 1906-8 amongst the rest of the native population—though chiefly in the mining quarters—of the town, only 14 cases were discovered amongst the Municipal natives. The absence of cases is probably explained by immunity conferred by previous attacks. The East Coast natives, and more especially the Quilimanes, who form a large proportion of the mining population, are unprotected and readily contract the disease.

Enteric Fever.—Appended are the statistical particulars for the years under notice:—

Year.	Admissions.	Deaths.	Percentage presumed to be Paratyphoid Infections.	Case Mortality per cent.	* Case Mortality in Town as a whole.	Mortality per 1,000.	Mortality per 1,000 in Town as a whole.
1906-7	82	29	35.8	35.4	47.0	6.1	2.01
1907-8	50	12	61.5	24	32.4	3.4	1.2

* These figures refer to notified cases only.

The majority of cases came from the Rosherville (42), Concordia (41), and Main (25) Compounds, the total number from the other compounds being comparatively small.

The figures for 1906-7 and 1907-8, although shewing a welcome decline towards the end of the period marks a big increase over the preceding year, which however was admittedly a very mild one for Enteric all over South Africa.

SUMMARY OF CASES ADMITTED INTO THE NATIVE HOSPITAL, JULY 1ST, 1906—JUNE 30TH, 1907.

Ref. No.	DISEASE.	TOTAL.	COMPOUNDS FROM WHICH ADMITTED.														RESULT.					TOTAL.
			Main.	Van Beek.	Rosher-ville.	Concor-dia.	New-lands.	Show Grounds	Brix-ton,	Smit Street.	Smal Street.	Bur-ghers-dorp Destr.	Water Dept.	Tram-ways.	Light & Power.	Klip Spruit.	Cured or Re-lieved.	Still Ill.	Trans-ferred to other Hospital.	Discharged unfit or to Convalesce at Home.	Died.	
1	C. S. Meningitis	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	1
2	Chickenpox	5	2	1	...	...	...	...	...	...	...	...	...	...	2	...	...	...	5	...	...	5
3	Measles	10	3	...	...	...	...	...	5	...	...	...	...	...	2	...	...	10	...	...	...	10
4	Influenza	61	17	6	9	4	3	...	18	...	...	...	3	...	1	...	59	2	...	...	...	61
5	Mumps	4	2	...	...	...	...	...	...	...	...	...	2	...	...	...	2	...	2	...	...	4
6	Simple Cont. Fever	15	1	1	5	3	...	...	3	...	...	2	...	...	...	...	15	...	...	...	...	15
7	Enteric	82	15	3	24	26	6	...	5	...	1	...	1	...	1	...	32	4	...	17	29	82
8	Diarrhoea	8	1	1	...	1	2	...	2	...	...	...	1	...	...	...	7	...	...	1	...	8
9	Dysentery	10	2	...	...	4	...	...	1	1	...	1	...	...	...	1	5	...	...	...	5	10
10	Leprosy	2	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	2	...	...	2
11	Venereal	8	3	...	1	...	...	...	2	...	...	...	...	...	1	1	...	...	8	...	...	8
12	Diseases due to Animal Parasites	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	1
13	Scurvy	4	2	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	1	3	...	4
14	Rheumatism	23	6	2	...	2	2	...	11	...	...	...	...	...	...	...	20	...	...	3	...	23
15	Debility	9	1	...	1	2	1	...	3	...	...	1	...	...	...	...	8	...	...	1	...	9
16	Diseases of Nervous System	4	2	...	...	1	...	...	...	...	...	...	...	...	1	...	4	...	...	...	...	4
17	Dis. of the Eye	2	...	...	...	...	1	...	...	1	...	...	...	...	...	...	2	...	...	...	...	2
18	Do. Ear	3	1	...	...	...	...	...	...	...	1	...	1	...	...	...	3	...	...	...	...	3
19	Do. Heart and Blood Vessels	2	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2
20	Bronchitis	17	2	5	3	1	...	...	3	...	1	...	2	...	...	...	15	2	...	...	...	17
21	Pneumonia	52	8	14	6	2	1	2	11	...	...	...	6	...	2	...	18	4	...	8	22	52
22	Tubercle of Lungs	5	...	1	...	1	1	...	1	...	...	...	1	...	...	...	...	1	...	4	...	5
23	Other Tubercular Diseases	2	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2
24	Pleurisy	5	2	1	...	1	...	...	1	...	...	...	...	...	...	...	3	...	...	2	...	5
25	Suppurative Parotitis	2	...	...	...	1	...	...	...	...	...	...	...	...	2	...	1	1	...	1	...	3
26	Tonsillitis	4	...	...	...	...	...	...	3	...	...	...	...	...	1	...	4	...	...	...	...	4
27	Gastritis	15	1	5	...	2	1	...	3	...	...	...	1	1	1	...	15	...	...	...	...	15
28	Diseases of Intestines	3	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	3
29	Jaundice	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
30	Nephritis	2	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	2	2
31	Diseases of Joints	3	1	...	...	...	...	...	...	...	...	1	1	...	...	...	1	1	...	1	...	3
32	Inf. Connective Tissues	2	...	1	1	...	...	...	...	1	...	...	1	...	...	...	1	...	1	...	...	2
33	Abscesses	9	2	1	...	1	...	...	1	1	1	...	1	...	1	...	3	...	6	...	...	9
34	Diseases of the Skin	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	1
35	Injuries	99	17	10	11	12	15	3	12	2	3	2	7	1	4	...	77	1	19	1	1	99
36	Ill defined	56	15	2	4	11	4	...	15	...	...	...	1	1	3	...	52	...	...	4	...	56
37	All other Causes	22	4	3	4	3	...	...	4	...	...	...	2	1	1	...	15	...	3	1	3	22
TOTALS		555	112	57	72	82	39	6	108	5	7	8	30	4	23	2	364	16	58	51	66	555



SUMMARY OF CASES ADMITTED INTO THE NATIVE HOSPITAL, JULY 1st, 1907—JUNE 30th, 1908.

Ref. No.	DISEASE.	TOTAL.	COMPOUNDS FROM WHICH ADMITTED.													RESULT.					TOTAL.
			Main.	Van Beek.	Rosher- ville.	Concor- dia.	New- lands.	Brix- ton.	Smit Street.	Burgers- dorp Destr.	Natal Spruit Destr.	Water Dept.	Tram- ways.	Light and Power.	All other Com- pounds.	Cured or relieved.	Still Ill.	Trans- ferred to other Hospitals.	Discharged unfit or to convalesce at Home.	Died.	
1	C. S. Meningitis	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
2	Chickenpox	9	2	3	...	...	...	...	1	...	...	...	1	2	...	...	...	9	...	...	9
3	Measles	6	...	5	...	...	...	...	...	1	...	...	...	...	...	...	...	6	...	...	6
4	Influenza	40	10	10	5	9	...	1	...	2	1	1	...	...	1	40	...	...	...	...	40
4a	Erysipelas	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
5	Mumps	4	3	...	1	...	...	...	...	...	...	...	...	...	...	1	...	3	...	...	4
6	Simple Cont. Fever	16	1	...	9	3	...	...	1	...	...	...	1	1	...	16	...	...	...	...	16
7	Enteric Fever	50	10	2	18	15	...	...	1	1	...	1	1	1	...	25	...	...	13	12	50
7a	Malaria	5	2	1	...	...	...	...	...	1	...	1	...	...	...	5	...	...	...	...	5
8	Diarrhoea	4	...	1	...	...	...	2	...	1	...	...	...	...	...	4	...	...	...	...	4
9	Dysentery	9	...	2	...	5	...	...	2	...	...	...	...	...	...	4	...	...	...	5	9
10	Leprosy	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	Venereal	9	...	1	1	...	...	...	...	...	...	1	...	3	3	2	...	7	...	...	9
12	Diseases due to Animal Parasites	2	...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	1	...	2
13	Scurvy	3	1	...	2	...	...	...	...	...	...	...	...	...	...	2	...	...	1	...	3
14	Rheumatism	18	...	1	3	7	...	1	2	1	...	2	...	1	...	14	1	...	3	...	18
15	Debility	14	1	...	10	1	...	...	...	2	...	...	...	...	...	13	...	...	1	...	14
16	Diseases of Nervous System	5	...	...	1	1	...	2	...	1	...	...	...	...	...	1	...	...	4	...	5
17	Do. of the Eye	7	2	2	...	1	...	...	...	...	...	...	...	2	...	6	1	...	...	...	7
18	Do. do. Ear	1	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
19	Do. do. Heart & Blood Vessels	2	1	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	1	2
20	Bronchitis	18	3	2	5	3	...	...	...	1	...	1	2	1	...	17	...	...	1	...	18
21	Pneumonia	52	5	13	9	3	...	2	1	4	1	10	2	1	1	39	2	...	3	8	52
22	Tubercle of Lungs	13	4	3	2	1	...	1	...	...	...	1	...	1	...	...	...	8	5	...	13
23	Other Tubercular Diseases	8	3	...	2	1	...	...	1	...	...	...	1	...	...	1	...	1	5	1	8
23a	Silicosis	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1
24	Pleurisy	4	1	1	1	...	...	...	1	...	...	...	...	...	...	4	...	...	...	...	4
25	Suppurative Parotitis	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	1
26	Tonsillitis	12	3	5	...	1	...	...	...	1	1	...	1	...	...	12	...	...	...	...	12
27	Gastritis	11	3	1	3	3	...	...	...	...	...	...	1	...	...	11	...	...	...	...	11
27a	Other Disorders of Digestion	8	5	...	...	1	...	...	...	...	...	...	...	1	1	7	...	1	...	...	8
28	Disease of Intestines	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
29	Jaundice	1	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
30	Nephritis	2	...	...	2	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	2
31	Disease of Joints	1	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	1
32	Inflammation Connective Tissues	5	...	2	...	...	...	...	...	1	1	...	...	1	...	5	...	...	...	...	5
33	Abscesses	12	4	1	3	1	...	...	2	...	...	1	...	...	...	10	...	1	...	1	12
34	Diseases of the Skin	2	...	1	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	2
35	Injuries and Burns	128	30	19	23	31	3	2	3	5	...	1	1	8	2	111	2	2	4	9	128
36	Ill-defined and Minor Ailments	58	2	2	14	24	...	6	2	1	2	3	...	1	1	54	...	...	4	...	58
37	All other Causes	28	9	2	4	6	...	...	4	1	...	...	...	1	1	26	...	1	1	...	28
		572	107	81	120	121	3	18	21	25	6	23	11	26	10	439	6	32	51	44	572



The housing accommodation at the various compounds was practically the same. The same rations were issued from the central store and with the exception of Rosherville and Concordia, they had the same water supply from the town mains. The water supply at Rosherville was drawn from a borehole and although repeatedly tested, was found quite satisfactory. At Concordia it was formerly otherwise but by pumping an improved supply was obtained from an enclosed spring which issued direct from the rock. Both the chemical and bacteriological examinations of this water were also above suspicion. It is true that the native quarters both at Rosherville and Concordia were situated fairly close to the night-soil trenches which, in the warm weather, abounded with flies. These infested the compound rooms in swarms and covered any articles of food which were not protected. The cases, however, from Rosherville, were fairly evenly distributed through the year, while flies occurred during the warm weather only.

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At the Main Compound, however, these conditions did not exist, and as soon as the new outfall sewer is brought into use it is hoped that the depositing sites will be abolished and that where the pail system remains in force, the night-soil will be emptied from the collecting carts direct into specially constructed intakes. This no doubt will remove a likely factor in the spread of the disease, but the "Occupation Risk" must always remain as long as the night-soil is directly handled.

While improved methods of diagnosis (blood cultures, etc.), might account for a small increase, the larger number of cases in the town was probably the chief reason, and whatever may have been the general factors responsible for the larger outbreak of Enteric in the town as a whole, there is no reason to suppose that they would not have equally affected the Municipal natives. Any increase of Enteric in the town, however, operated in a far more serious way.

The natives at the three Compounds were engaged on the various scavenging services and it is easy to understand how, when the disease has once appeared in epidemic form in the town, natives engaged in handling domestic refuse or night-soil and not protected by previous attacks, are liable to infection. That this risk is a real and considerable one is shewn in the following table from which it will be seen that more than 71 per cent. of the cases occurred amongst the natives engaged in "scavenging."

TABLE SHEWING NATURE OF WORK ON WHICH NATIVES WHO CONTRACTED ENTERIC WERE ENGAGED.

Nature of Work.	No. of Class.		Total.	Percentages.
	1906-7.	1907-8.		
Handling of night soil ..	37	15	52	39.3
Removal of Rubbish ...	11	4	15	11.3
Removal of Slopwater ..	9	5	14	10.6
Drivers and Leaders of night-soil carts	—	13	13	9.8
Working in Stables ...	7	6	13	8.9
Police, office and Compound work	7	4	11	8.3
Working on Roads	7	2	9	6.8
Stokers	1	1	2	1.5
Trolley Drivers	1	—	1	.75
Unknown	2	—	2	1.5
	82	50	132	

From the above it would appear that the chances that a native, employed in handling night-soil, will contract Enteric Fever, are more than three times those of boys engaged in other work.

The results, however, are not surprising in view of our knowledge that the disease is spread chiefly through the agency of the alvine discharges.

Taking the figures for Johannesburg as a whole it would appear that less than 4 out of every 1,000 persons living at all ages contract Enteric Fever annually, whilst amongst the Municipal natives over 16 do. The risk to Municipal natives, therefore, of contracting Enteric Fever apparently is 4 times as great as that of the white population. The different "age-constitution" of the respective populations, however, must be borne in mind, quite apart from the "occupation-risk" above referred to.

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A fair deduction to draw, however, and one which from other experience seems to be justified, is that natives are just as susceptible as whites, to Enteric Fever, if not more so. As a rule it is only the more severe cases which come under notice ; the milder continue their work and no doubt assist in the spread of the disease.

The Tribal incidence is shewn in Table (D) :—

TABLE (D)—TRIBAL INCIDENCE OF ENTERIC FEVER—

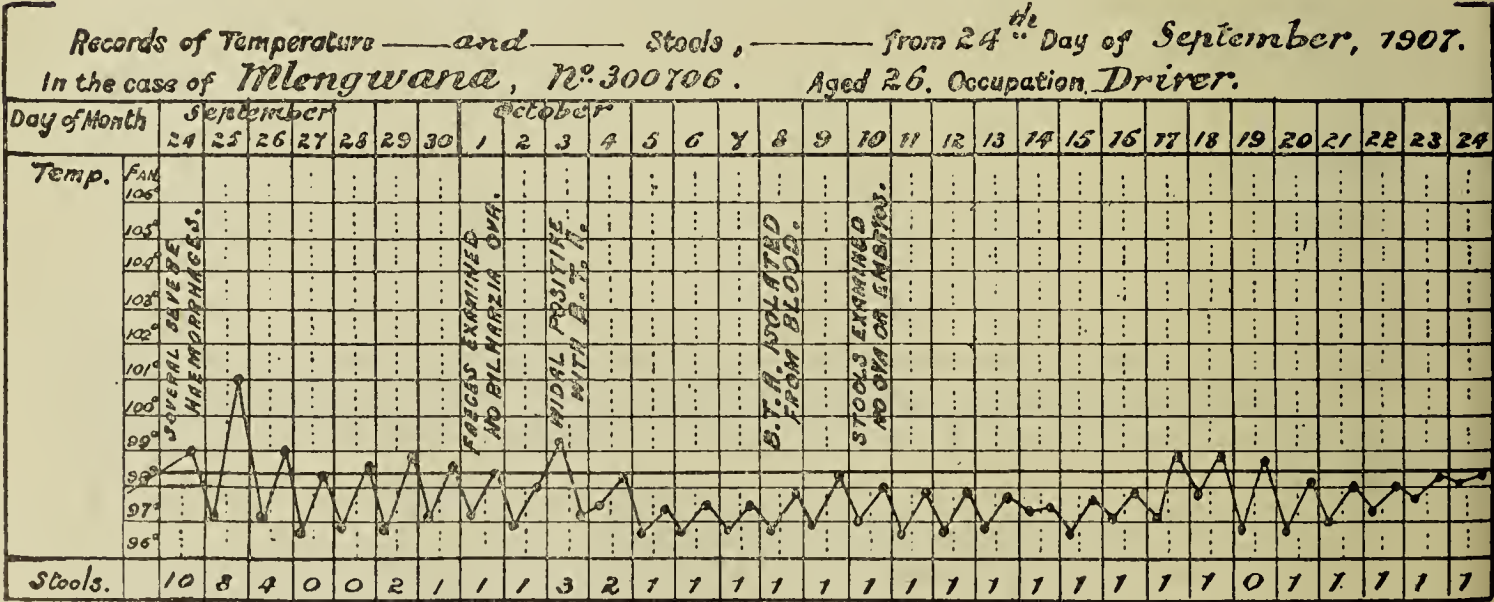
TRIBE.				NO. OF ENTERIC CASES.		
				1906-7.	1907-8.	Total.
Baca	...	...	...	54	29	83
Basuto	...	...	...	9	5	14
Transvaal Basuto	...	...	...	8	2	10
M'Xosa	...	...	..	6	5	11
Zulu	...	...	...	3	1	4
M'Pondo	...	...	...	1	2	3
Swazi	...	...	...	—	1	1
Not Known	...	...	...	1	1	2
Shangaan	...	...	...	—	1	1
Griqua	...	...	...	—	3	3
Total	...	...	...	82	50	132

At first sight it would appear that Bacas are specially liable to contract the disease, but it must be remembered that Bacas are almost the only natives who will handle night-soil.

Clinical Aspects of the Disease.—The character and the severity of the attacks ranged from those with a few days' fever with perhaps headache and looseness of the bowels, to the most intense infections which were only too often fatal.

The case mortality is far too high, but it must be remembered that many cases only come into Hospital when the disease is already far advanced, and that highly-skilled nursing—so desirable in Enteric Fever—is not available. The case mortality, however, is not nearly so high as in the town as a whole ; but, on the other hand, there can be little doubt that while deaths from enteric amongst natives are fairly correctly recorded, many cases escape notification altogether.

In this connection, reference may be made to the following case of Afebrile Enteric (*i.e.*, Enteric Fever without temperature) which came under notice :—



Mlengwana—a Baca—aged 26, was admitted to the Native Hospital on the morning of September 24th, on account of a severe haemorrhage from the bowel, with a history of two weeks indefinite illness. Shortly after admission he passed over a pint of nearly pure blood

followed by two more haemorrhages during the afternoon and evening. He was placed on large doses of Calcium Chloride and Turpentine and given a small hypodermic injection of morphia, being kept as quiet as possible in bed. The next morning his condition had improved, but the temperature which was then sub-normal, rose to 101° in the evening. The temperature did not rise again above normal during the remainder of his stay in Hospital except on two occasions, viz. on October 3rd when it rose to 99·4° and on October 18th and 19th when the evening readings were 99°. There was no diarrhoea and on October 1st a specimen of fairly normal faeces was carefully examined for Bilharzia ova, as it was thought that the haemorrhage might be due to their presence in the bowel; the enlargement of the spleen being attributed to an old malarial infection. No ova, however, were found and a rise of temperature being noted on October 3rd a sample of blood was sent to the Government Laboratories. This was reported as giving a positive Widal reaction with a strain of B.T.A., but as the patient's general condition still gave cause for anxiety he was kindly seen in consultation on October 8th, by Dr. Aylmer May, the late Government Bacteriologist, who afterwards isolated a pure culture of Typhoid Bacillus from a specimen of blood he then collected. The recovery of Typhoid Bacilli from the peripheral blood established the diagnosis of Afebrile Enteric and removed the doubts previously entertained. The after history of the case was uneventful, the tongue gradually cleaning and the patient's general condition improving. On November 8th he was sent home to convalesce.

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From the literature at hand it would appear that Afebrile Enteric is fairly rare, though its frequency is difficult to appreciate. It usually occurs in elderly, decrepid persons, or those debilitated by over exertion, alcoholism or chronic disease, and in a minority of cases is severe and occasionally fatal.

That such cases may escape notification is not surprising.

The figures for 1907-8 in respect to both the case mortality and the mortality per 1,000 show a considerable improvement over the preceding year, and in this connection it is of interest to note the results of the Widal examinations.

In each year the blood of approximately 50 per cent. of the cases were submitted to this test, with the results shown below :--

Result.	1906-7	1907-8
Negative	15	1
Agglutination of B.T.A.	10	9
Agglutination of Paratyphoids	14	16
	39	26

The figures, as far as they go, suggest that in 1906-7 some 35 per cent. of the cases were Paratyphoid infections, while in 1907-8 the percentage was over 66.1 It is not contended that a Widal Examination alone can be relied upon to indicate the nature of the infection, but Paratyphoid infections are generally accepted as being less fatal than true Enteric. Taking all the circumstances into consideration, it is probable that the drop in the mortality per 1,000 figure for 1907-8 which corresponds with the probable increase of Paratyphoid infections, is due to more than mere coincidence. (The technique followed in carrying out the Widal Examination is detailed in the Appendix.)

To accurately determine the nature of an infection recourse must be had to direct blood culture, but while improved methods have made this a fairly simple matter, the procedure was only adopted in 1907-8 and then in selected cases. The results, though mainly in accord with the above, are too few for statistical purposes, and therefore not included.

For clinical purposes it is usually sufficient to know whether the patient is suffering from a disease belonging to the "Typhoid Group," but in this connection both Blood Culture and Widals have their limitations. An attempt was therefore made to see how far the method recommended by Chantemesse of instilling a weak solution of Typhoid Toxin into the Conjunctival Sac—in a similar manner to that which has been adopted in Tubercular Infection—was of use. Unfortunately, the greatest difficulty was experienced in preparing the toxin, and it is doubtful whether the method will be of practical use.

Complications.—Complications do not call for any special notice. Diarrhoea was uncommon, but Relapses were fairly frequent.

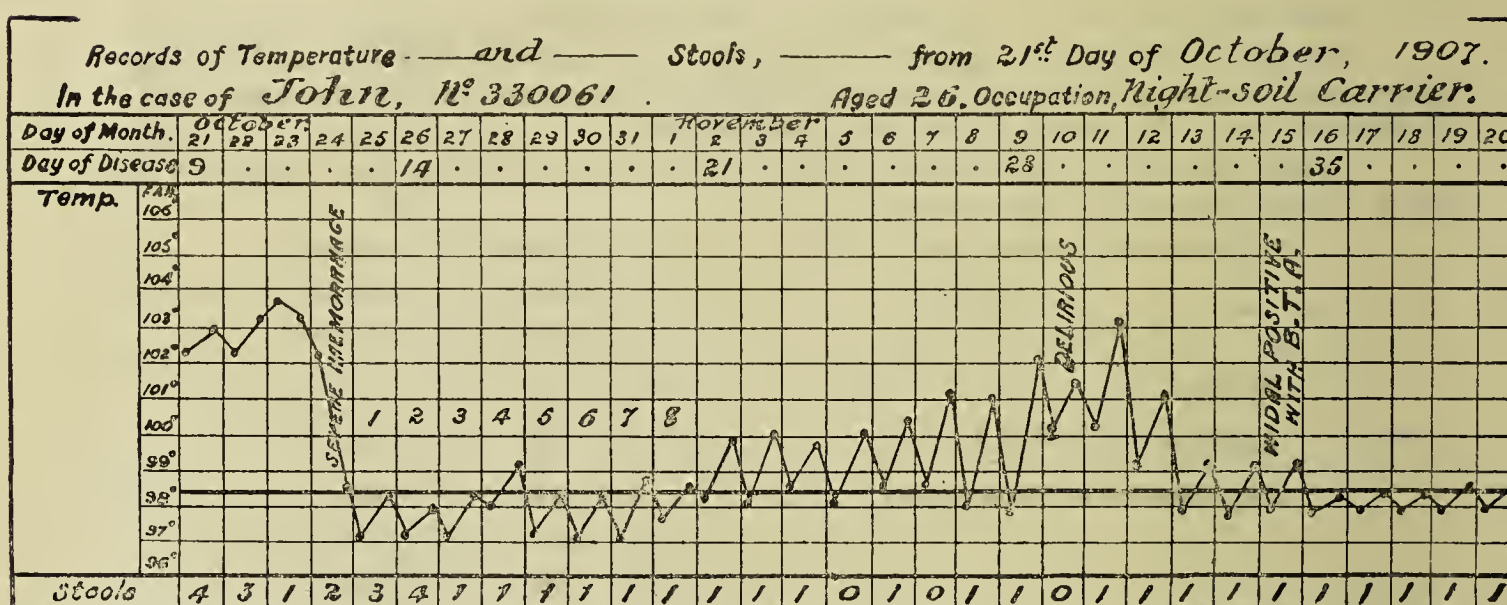
Severe haemorrhages were noticed in eight cases, of which three ended fatally.

Secondary Parotitis, reference to which was made in a previous report, occurred in two cases, and a severe Glossitis in one. Contrary to previous experience amongst Europeans, Thrombosis was rare, and only occurred in two instances. In 12 cases, or

M.O.H. 1906-9 9 per cent., perforation of the bowel was the immediate cause of death, a figure which is unusually high when compared with the 5·7 per cent. found amongst 2,000 autopsies at Munich, or the 2·7 per cent. which occurred amongst 829 cases treated in Osler's wards at the John Hopkins Hospital. In one case of Perforation sent to the Johannesburg Hospital for operative treatment, the Proglottis of a tape worm was found lying free in the peritoneal cavity, an observation which may throw some light on the high proportion of deaths from this cause. The presence of Intestinal Parasites is always a source of anxiety as the patient's condition seldom permits of vigorous treatment. In one case, after an apparent recovery, death occurred some months later from Marasmus, due to progressive atrophy of the bowel mucosa.

TREATMENT AND PROPHYLAXIS.—The treatment adopted calls for no special mention, but reference must be made to the improvement noticed in certain cases after a moderate hemorrhage, of which the following is an example:—

“John, No. 330,061, a Baca, was admitted on October 21st, 1907, with a temperature of $102^{\circ}2'$, and a history of eight days' illness, complaining of abdominal pains and a severe headache. The temperature remained above 102° until the 24th, when, following a moderately severe hemorrhage, the evening reading was $98^{\circ}4'$, and, with the exception of an evening rise on the 28th, the temperature remained normal or sub-normal for eight days. The lowering of the temperature was accompanied by a marked improvement in his general condition. Unfortunately no attempt was made to estimate the agglutinating properties of the blood until November 15th, when a positive result was obtained to an ordinary ‘Widal.’”



Formerly such an improvement would have been attributed probably to the freeing of the system of a certain amount of Toxins, but the recent work of Dryer and Schroeder has shewn that the removal of blood may be made to act in a similar way to a bacterial injection and to cause an increase of the specific agglutinating power.

A consideration of the above suggests the likelihood of selected cases, more especially where toxæmia is a prominent symptom, being benefited by moderate bleeding. If necessary any lowering of the blood pressure could be obviated by Saline injections.

The Prophylaxis consisted in measures calculated to improve the general sanitary circumstances, but in view of the occupation-risk above referred to the question is being considered of affording facilities for anti-typhoid inoculation to all natives engaged in night-soil work. English Army Statistics continue to show great promise for this method, but how far natives could be persuaded to submit themselves for treatment is an open question.

The possibility of natives afterwards becoming “Carriers” is a serious one, more especially when their custom of promiscuously defæcating is remembered. Such, however, is believed to be one of the chief causes of the endemicity of Enteric in South Africa, but at the same time it must be admitted that the condition is one of the most difficult with which to deal in a practical manner, as ordinary forms of treatment are useless.

It is hoped that opportunity will be afforded for carrying out an inquiry into the number of natives who excrete Typhoid germs in their discharges during and after convalescence.

II. TUBERCULAR DISEASE.—There were 28 admissions and 6 deaths during the period under review, of these 18 were due to tubercle of the lungs, the remainder to tubercle of the other parts of the body. Of the 6 deaths, all of which occurred during 1907-8, five were due to tubercle of the lung (or phthisis) and one to tubercle of the liver. Unfortunately, the figures for 1907-8 would appear to indicate that tuberculosis of the lungs is on the increase. The patients only came under observation when the disease was fairly advanced, the

diagnosis in each case being confirmed by the finding of tubercle bacilli in the sputum. M.O.H. 1906-9
 Since recruiting has been stopped, natives are engaged locally, and while it may only be a coincidence, in each case a history of previous work underground was obtained. Apparently the natives had become infected either before or during their stay on the mines, but finding their strength failing, came to the Council in the hope of getting lighter work. The figures, however, are hardly sufficient to permit of very reliable conclusions being drawn therefrom. Health of
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III. VENEREAL DISEASE.—There were 17 admissions for venereal disease, 2 only with tertiary manifestations being treated in the compound hospital, the remainder being sent to the Lazaretto at Rietfontein. Whether this represents the whole of those affected it is difficult to say, as only those seeking medical advice came under direct observation. It is thought, however, that the figures are comparable with those for former years, and the ratio per 1,000 per annum is set out in the following table :—

TABLE SHOWING ADMISSIONS FOR VENEREAL DISEASE.

Year.	Ratio per 1,000.
1904-05	1·6
1905-06	5·7
1906-07	1·6
1907-08	2·5

The probable explanation of the big increase during 1905-6 was the removal of the Kaffir Location to Klipspruit. With lessened possibilities of intercourse, recourse would naturally be had to the few remaining sources, with increased likelihood of infection being spread. The majority of the admissions coming from the town, and not from the outlying compounds, also bears out the above. During the period under review the conditions have returned more to the normal, and do not appear to indicate any undue prevalence of the disease.

The subject is one of considerable importance, however, as many native customs tend to spread the disease broadcast and in certain districts in Uganda* the incidence of syphilis has been placed as high as 90 per cent. There the disease is the chief cause of the high infantile mortality, and unless checked, threatens to decimate the inhabitants.

In 1906 the subject was investigated by a Government Commission which was appointed (a) to consider and report to what extent contagious diseases were prevalent amongst the Native population in the Transvaal; and (b) to submit a definite scheme for the treatment of such diseases, suitable to the conditions of life of the said population.

The Commissioners—of whom Dr. Porter was one—presented their Report in 1907.

Briefly; their recommendations necessitate Government—rather than Municipal—action: but reference to the original Report should be made for fuller information. Probably, however, if any large number of patients have to be treated, it will be found that the most practicable method will be that of intra muscular injection.

The subject will be kept in view as far as it effects the Municipal Native.

IV. PARASITIC DISEASES.—There were only three admissions for diseases depending on animal parasites, all being due to Bilharzia.

This, however, cannot be taken as any indication as to the number affected; most Natives harbouring parasites of some kind in their intestines.

With regard to Bilharzia Disease; Natives only come under observation for the acute symptoms or some concurrent disease. Bilharzia Disease is, however, widely distributed in South Africa: and, in a previous contribution to the *Lancet*† some of the sources to which the disease—amongst Whites—had been traced were quoted. More recently, Dr. Geo. Turner, Medical Officer to the Witwatersrand Native Labour Association, has carried out some most valuable investigations.

He points out that, while no doubt most of the European boys in Cape Colony, Natal, and the Transvaal get rid of symptoms at about 20 years of age, amongst Natives living in the Tropical or Semi-tropical parts the disease does not take such a favourable course, and that probably there is no disease which causes the Native inhabitants of the Province of Mozambique so much worry and anxiety as Bilharziosis. At present there is no proof that the causative agent in Whites and Natives is otherwise than the same, but the possibility of the infection being due to more than one kind of *Schistosomum* must not be lost sight of.

* *Journal of R.A.M.C.*, p. 241, vol. xiii.

† *Lancet*, September, 1906.

M.O.H. 1906-9 The disease undoubtedly has a debilitating effect on the Native constitution, and probably renders him more liable to Tuberculosis and other diseases when he leaves his kraal to seek work in a colder climate.

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Formerly it was held generally that the disease rarely affected the lungs; though Cobbold—many years ago—associated Bilharziosis with respiratory complaints, in that he suggested the peculiar susceptibility of the South African Natives to Pneumonia might be accounted for by the prevalence of Bilharzia Disease amongst them.

In 1908-9, however, Dr. Turner was led to make a systematic microscopical examination of all lungs obtained at Native autopsies, and found that over 50 per cent. contained the eggs; in many cases enormous numbers being present. Most of these Natives came from comparatively low altitudes, being East Coast—or semi-tropical “boys.” These observations considerably enhance the importance of—and possible dangers from—this disease, but unfortunately no treatment at present known is of much use. On the other hand, there is no reason to believe that the disease spreads on the Rand—all the sufferers being infected probably before arrival.

V. SCURVY.—There were 7 admissions for this disease, being a ratio of ‘8 per thousand. This figure is the same as for 1905-6.

There were no deaths.

The mortality alone amongst the South African Coloured population in the Town as a whole was over ‘5 per thousand, but figures as to the INCIDENCE of the disease are not available.

The comparative freedom of the Municipal native is probably largely due to the amount of fresh food procured in the Town.

VI.—RHEUMATIC AFFECTIONS.—There were 41 admissions and no deaths; 31 recovered and returned to work, and 10 were discharged to convalesce at home. The proportion of severe cases has been considerably higher than in former years; and it is understood that the general experience is that the type of disease met with amongst natives on the Rand is fairly severe.

VII.—OTHER GENERAL DISEASES.—Causing admission call for no special comment.

2.—LOCAL DISEASES.

The only diseases calling for special mention under this heading are :—

DISEASES OF THE RESPIRATORY SYSTEM.—There were 149 admissions and 30 deaths, giving ratios of 18·1 and 3·6 per thousand respectively.

The admissions include :—

Bronchitis	...	...	35
Pneumonia	...	...	104
Pleurisy	...	...	9
and Silicosis	...	...	1

The deaths were all due to pneumonia. In one case a cerebellar abscess developed after otitis media, due to the pneumococcus.

PNEUMONIA.—After enteric, pneumonia still accounts for the largest number of deaths. In the subjoined Table are seen the admissions per 1,000 and case mortality for the past four years.

Pneumonia.—Table G.

Year.	Admissions per 1000.	Case Mortality.
1904-5	8·08	38·0 per cent.
1905-6	14·1	31·2 „
1906-7	10·9	42·3 „
1907-8	14·9	15·3 „

The case mortality for the last year is the lowest on record and was probably due to a milder type of the disease. If the figures for the whole period under review are considered, they correspond fairly closely with those for the two previous years.

(3) INJURIES.

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Under this heading are included cases of Homicide or Murder, Burns and Scalds.

During 1906-7 there were 99 admissions and 1 death; while, in 1907-8, the figures were 128 and 9 respectively. The increased number of deaths under this heading account for the higher death-rate during the latter year. They are chiefly attributable to accidents connected with transport and violence. There is no special reason for the increase; and it is hoped that the death-rate from this cause will again decline. The other admissions—with the exception of 1 death from “Gassing” and 3 cases of Delirium Tremens—do not require further notice. Their disposal is shewn in the accompanying Table.

The death from “Gassing” occurred in the engine-house at the Power Station and was fully reported on at the time.

With regard to the 3 cases of Delirium Tremens, no information could be obtained as to the sources whence the spirit was obtained. Possibly it was some form of “Skokiana.”*

(4) MINOR AILMENTS.

There were the usual number of minor cases treated at the Dispensary, none of which call for remark.

PART II.—INDIANS.

As in previous years, the amount of sickness amongst the Indians has been very small and does not require further notice.

PART III.—SANITARY CIRCUMSTANCES.

(a) HOUSING ACCOMMODATION.—The conditions at many of the Compounds leave much to be desired but for financial reasons the Council have been unable to give effect to many of the recommendations submitted. The laying of impervious floors and provision of hooded stoves or some other suitable means of heating are needed urgently in most compounds. Where it is possible compounds should be connected to the sewers. Following, however, first a re-arrangement and afterwards a reduction in the number of natives employed it was possible to abolish the three most unsatisfactory compounds, viz.: Bertrams, Smal Street, and the Old Show Ground, the natives from the last being transferred to Van Beek Street.

The Compound at Newlands has also been considerably reduced, only 22 natives being left where over 400 were employed. This reduction commenced in October, 1906, the plant, animals and natives being gradually transferred to Rosherville and Concordia.†

In July, 1907, the Establishment Sub-Committee who visited the native Hospital reported that everything had been found in a most satisfactory condition but recommended that the wood and iron wards be brick lined. These alterations were carried out, but it is to be regretted the recommendation to put a whole-time European in charge of the Hospital was not agreed to.

(b) DIET.—Considerable attention has been paid of late to the question of native diets, it being more and more recognised that to obtain the best work the human machine must be suitably fed. A valuable pamphlet on the diet of the South African natives in their kraals was published by Dr. George Turner in 1909. Dr. Turner points out that while the enormous differences which exist between the South African natives have to be borne in mind, it must be recognised that some common diet is essential, as it would be impossible to try and supply a special menu for each tribe or for each class of natives coming from a district. Apart, however, from improvements in the ration scale, on some mines dining halls for the coloured employees are being erected, a measure which should do much to raise the standard of cleanliness in the compound rooms.

The ration scale for the Municipal natives is as follows:—

Mealie Meal	...	...	2 lbs. daily.
Fresh Meat	...	...	2 lbs. weekly.
Fresh Vegetables	...	...	1 lb. per week.
Salt	...	...	1½ oz. per week.

* “Skokiana” is a term somewhat loosely applied on the Rand to most forms of illicit Native liquors. By many, however, it is confined to a drink made by fermenting a mixture of sugar, water and hops. When properly prepared it is not highly intoxicating but under certain circumstances may be a powerful intoxicant. One of the chief forms of “Skokiana” is “Khadi,” a mixture chiefly prepared from treacle and water, to which some species of Native plant is added to produce fermentation. “Khadi” is one of the most mischief-making beverages in South Africa.—(*The Diet of S.A. Natives.*—Turner.)

† With the openings of the “Intakes” in connection with the new outfall sewer, the depositing site at Rosherville was vacated in February and that at Concordia in April, 1909. The native quarters at these sites were taken down and new compounds established at Natal Spruit, Springfield and Wolluter.

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It does not err on the side of liberality, but the food is of good quality, and it must be remembered that the Municipal native largely supplements his rations either by his own exertions as a scavenger or by recourse to the many shops which abound for the purpose.

The cooking is now chiefly carried out in steam jacketted pots, and an issue of hot coffee is made at some compounds in the winter months to natives working at night.

(c) GENERAL.—Early in 1908 recruiting was stopped and all natives engaged locally. Up to the present it is understood the system has worked satisfactorily, more especially since 'piece' work was introduced, and it is found that the "Bacas" (night soil boys) return of their own accord to re-engage.

From casual observations it would appear that the proportion of native employees who can read and write is increasing, and it now is a fairly common sight to see a native drawing out letters on a slate for the benefit of his admiring fellows.

P. G. STOCK, M.R.C.S., D.P.H.,
Medical Attendant.

Appendix.

WIDAL REACTION FOR ENTERIC.

Thanks to the courtesy of the Government Bacteriologist—who has at all times not only examined specimens but in doubtful cases assisted with personal advice—the following particulars of the procedure followed at the Government Laboratories in carrying out the Widal reaction for Enteric Fever, are available:—

Widal Reaction.

The patients blood is tested against the following organisms:—

- (1) *Bacillus Typhus Abdominalis*—Strain A (obtained from England).
- (2) Do. do. do. —Strain B (isolated from case in Transvaal).
- (3) *Paratyphoid Bacillus*.—Strain I 'Brion & Kayser.'
- (4) Do. do. —Strain V 'Schottmüller "B".'

The following are the reactions of the above strains on "Hiss' Medium":—

RE-ACTIONS OF THE TYPHOID-COLI BACILLI ON HISS' MEDIA AND ON LITMUS MILK.

The formula of Hiss' Media is Serum, 1 part ; Water, 3 parts ; and Sugar, 1 per cent. The medium is made neutral to, and tinted with Litmus. In column (a) are shown the results obtained at the Government Laboratories, and in column (b) those by Boycott, who used broth media.—(See *Journal of Hygiene*, January, 1906, Vol. VI.)

Medium.	B. Typhi.	B. Para-typhoid. A.		B. Paratyphoid. B.		B. Gärtner.		B. Coli.
		(a)	(b)	(a)	(b)	(a)	(b)	
Glucose . . .	A.C.O.	ACG—ACO	A.G.	A.C.G.	A.G.	A.C.G.	A.G.	A.C.G.
Laevulose . . .	A.C.O.	A.C.G.	A.G.	A.C.G.	A.G.	A.C.G.	A.G.	A.C.G.
Galactose . . .	A.C.O.	A.C.G.	A.G.	A.C.G.	A.G.	A.C.G.	A.G.	A.C.G.
Mannite... . .	ACO—OOO	A.C.G.	A.G.	A.C.G.	A.G.	A.C.G.	A.G.	A.C.G.
Maltose	ACO—AOO	ACG—ACO	A.G.	ACG—ACO	A.G.	A.C.G.	A.G.	A.C.G.
Dulcite	s.AOO—OOO	ACG—ACO	A.G.	A.C.G.	A.G.	A.C.G.	A.G.	ACG—OOO
Lactose	s.AOO—OOO	s.AOO—OOO	O.	AOO—OOO	O.	O.O.O.	O.	A.C.G.
Glycerine	ACO—OOO	ACO—OOO	—	ACO—AOO	—	O.O.O.	—	ACG—OOO
Saccharose	ACO—OOO	ACO—OOO	O.	ACG—OOO	O.	O.O.O.	O.	ACG—OOO
Dextrin	ACO—AOO	ACO—s.AOO	A.G.	A.C.O.	A.G.	A.C.O.	A.G.	ACG—OOO
Litmus Milks	s.AO—AC	A.O—A.C	—	Alk.—A. and then Alk.	—	Alk.	—	A C.

NOTE.—A. = Acid.
C. = Clot.

G. = Gas.
Alk. = Alkaline.

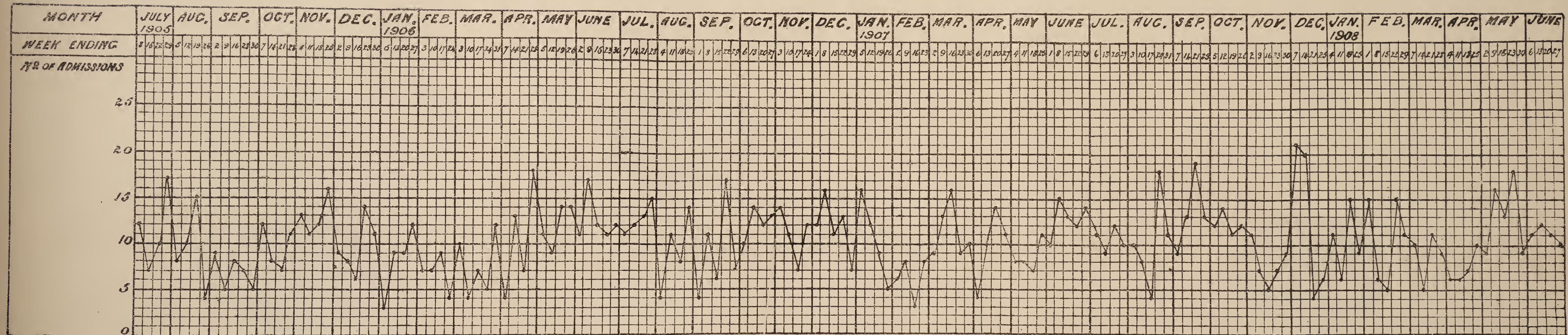
O. = No change.
s. = Re-action slight.

Two sets of re-actions in same square indicate alternate re-actions.
Time allowed : 5 days.



Chart shewing Weekly Admissions into the Native Hospital.

— July 1st 1905 — June 30th 1908. —



Note: During year ending 30th June 1906, there were 511 Cases admitted, and 41 Deaths.

— " — " — " — 30th June 1907, — " — " — 555 Cases — " — " — 66 Deaths.

— " — " — " — 30th June 1908, — " — " — 572 Cases — " — " — 44 Deaths.

